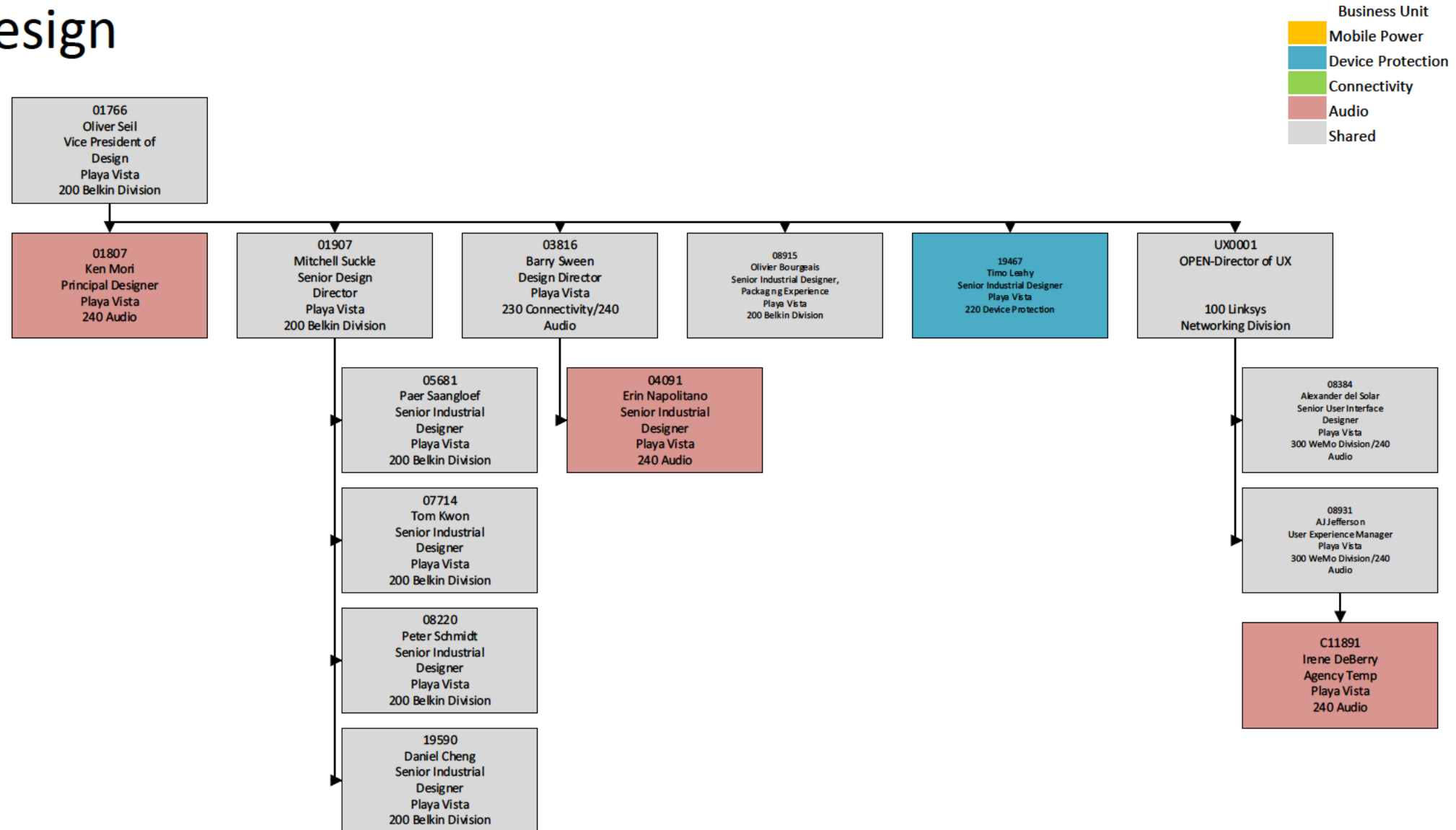


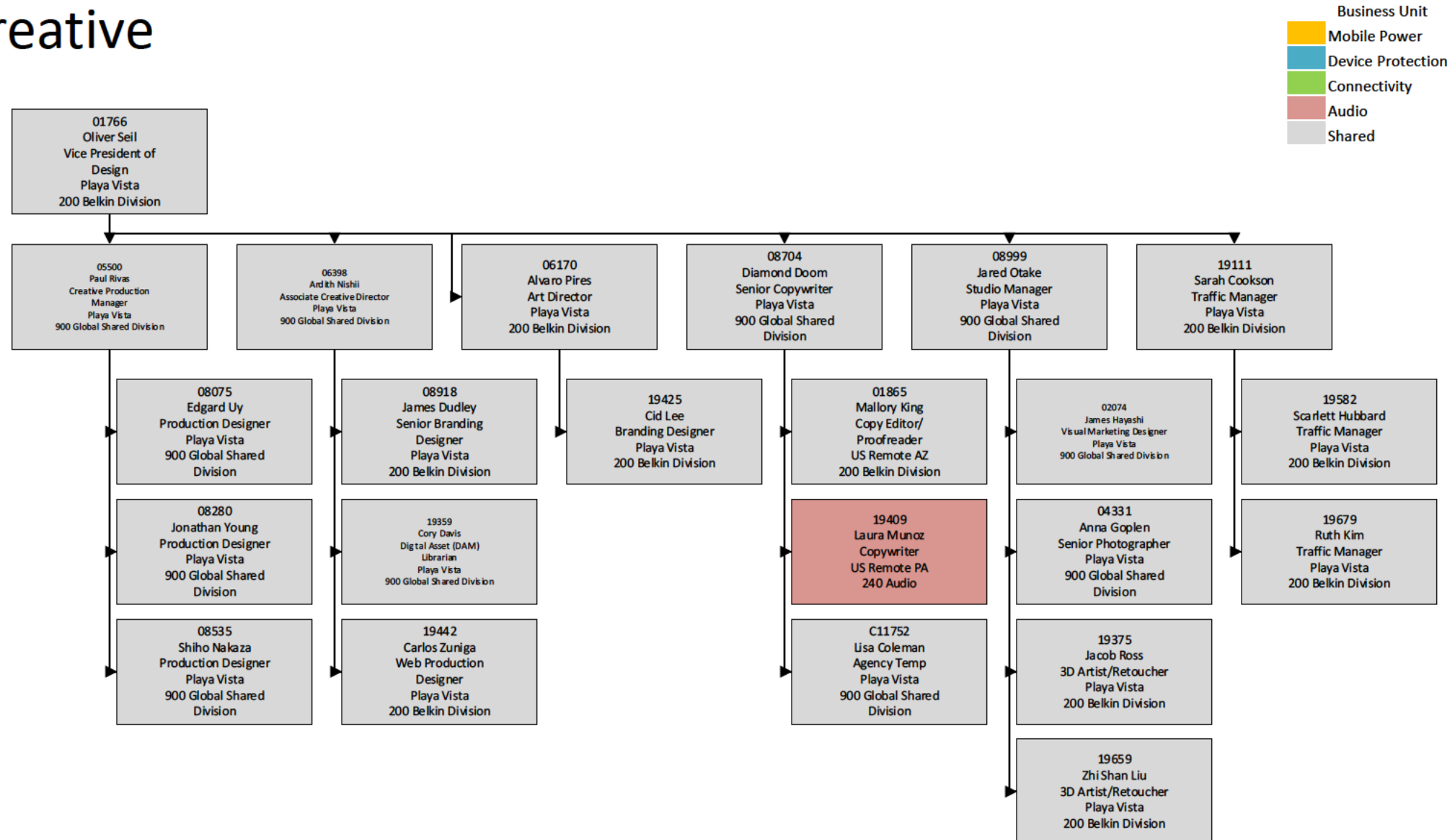
Design



CONFIDENTIAL

BELKIN_000001

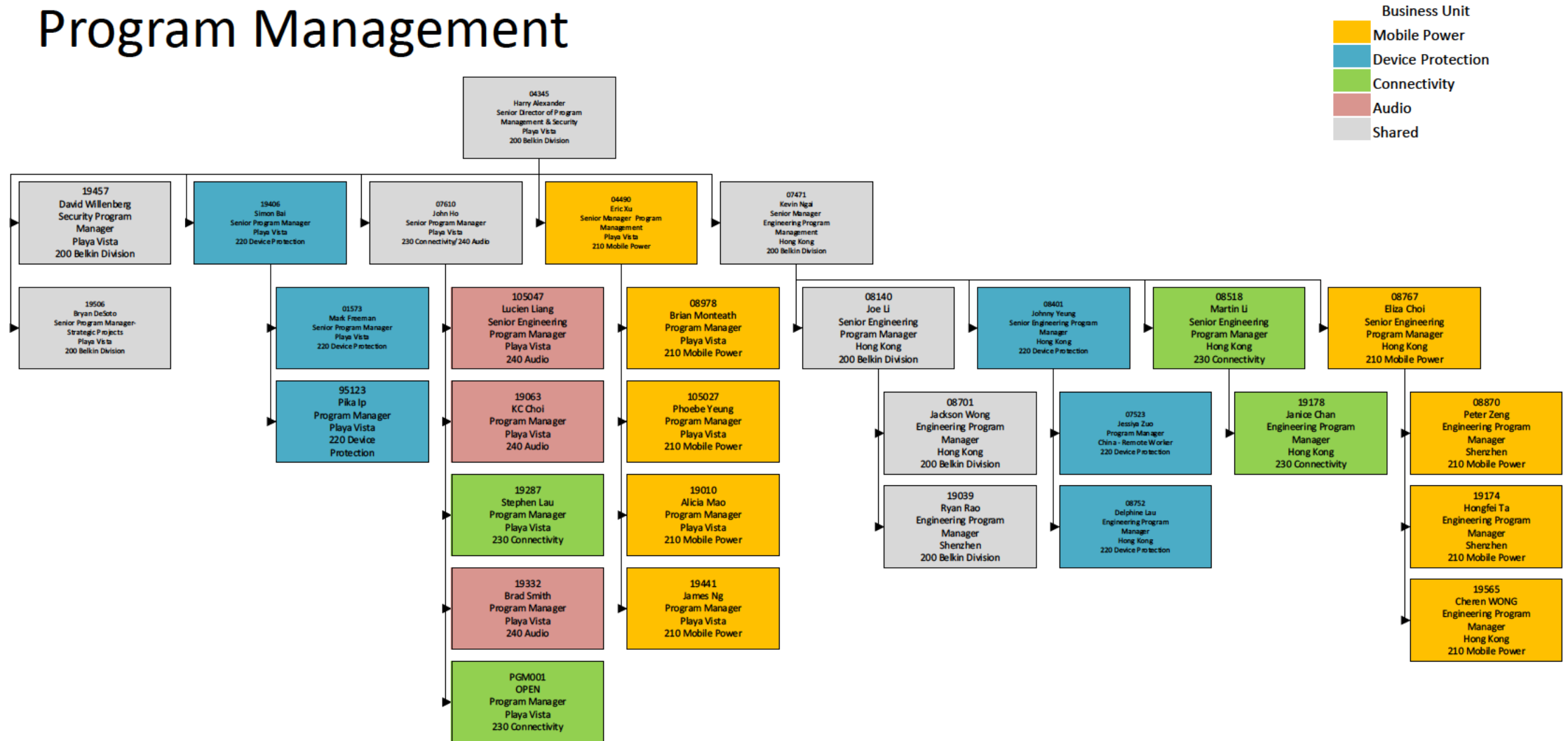
Creative



CONFIDENTIAL

BELKIN_000002

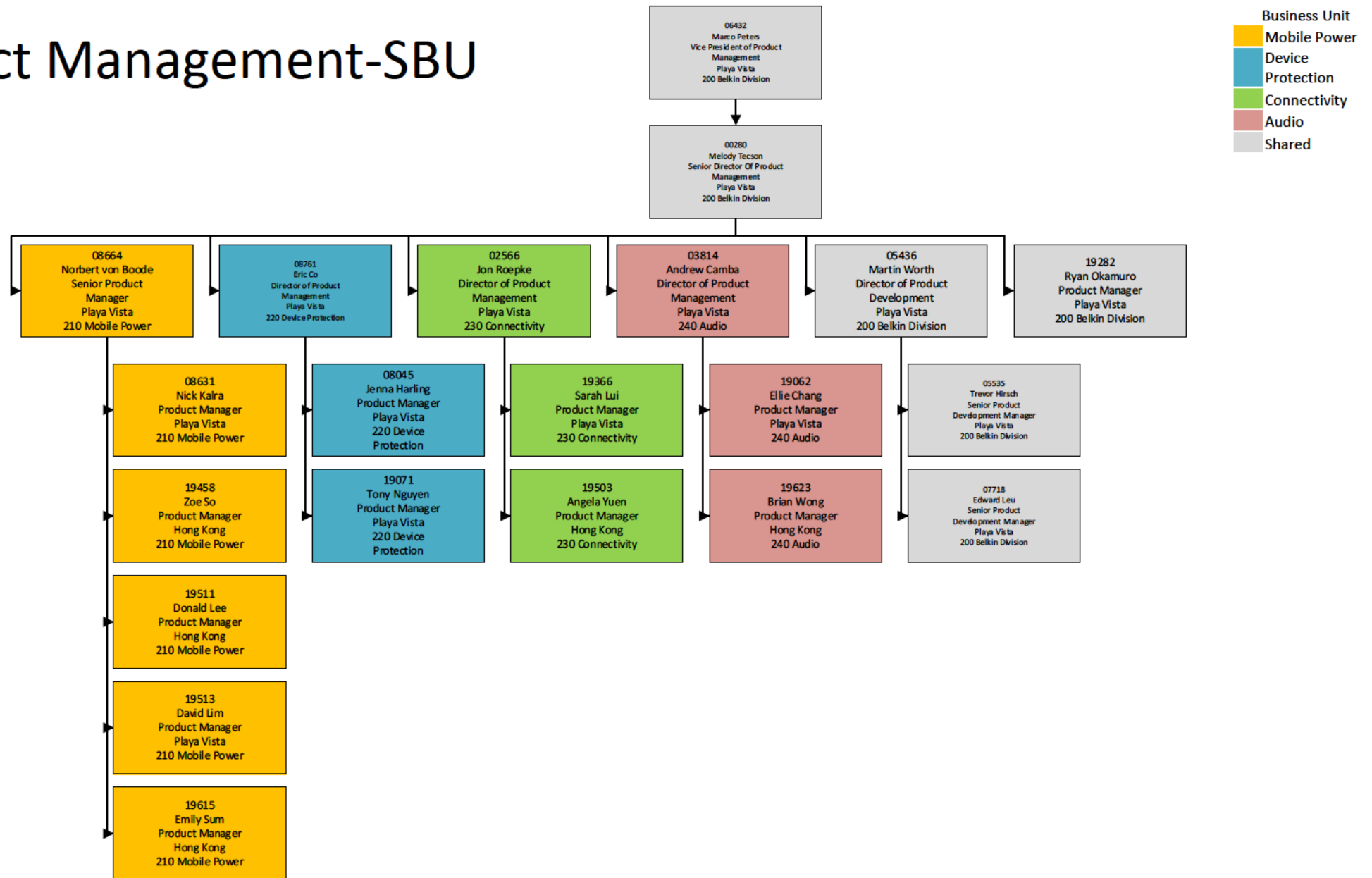
Program Management



CONFIDENTIAL

BELKIN_000003

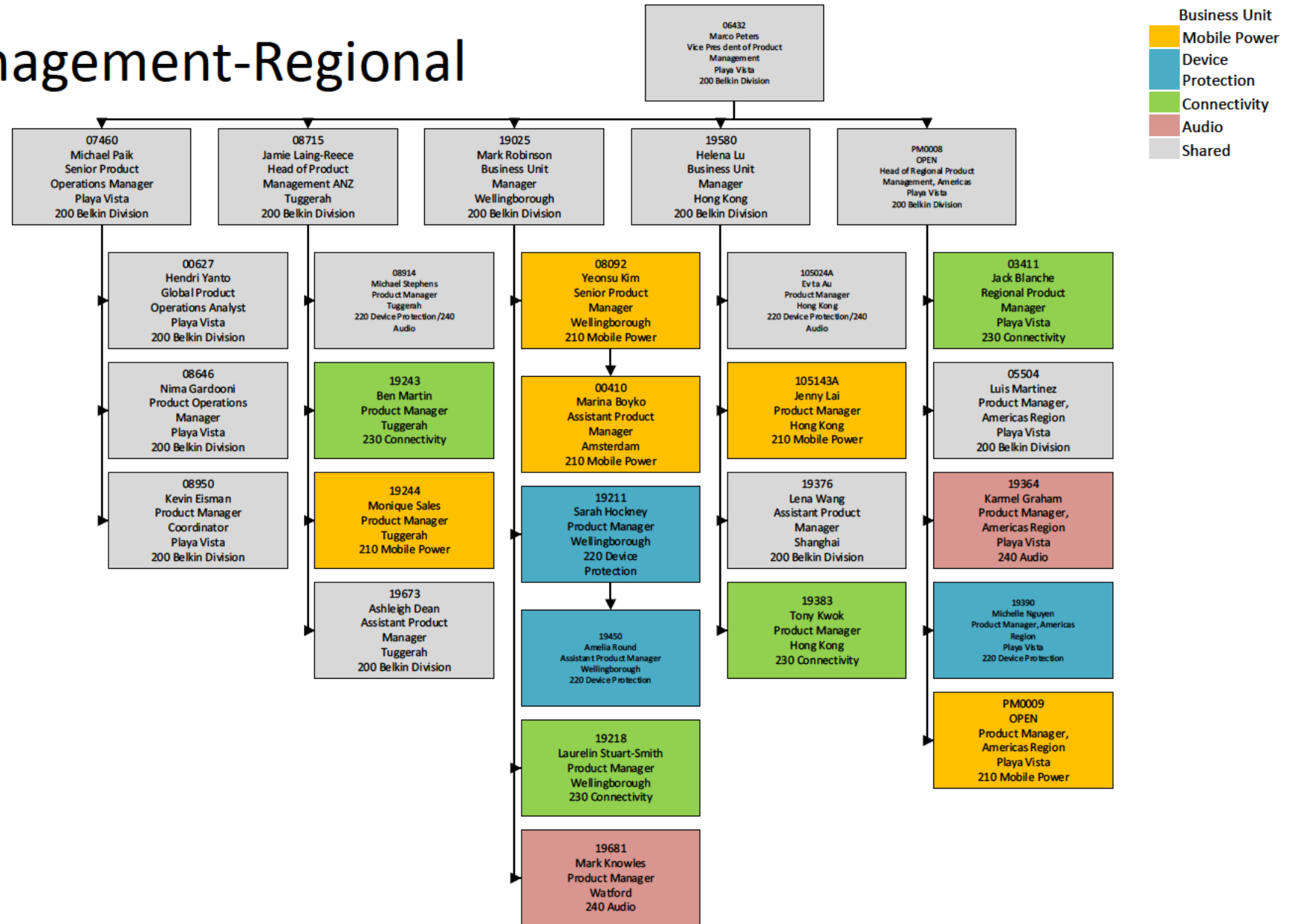
Product Management-SBU



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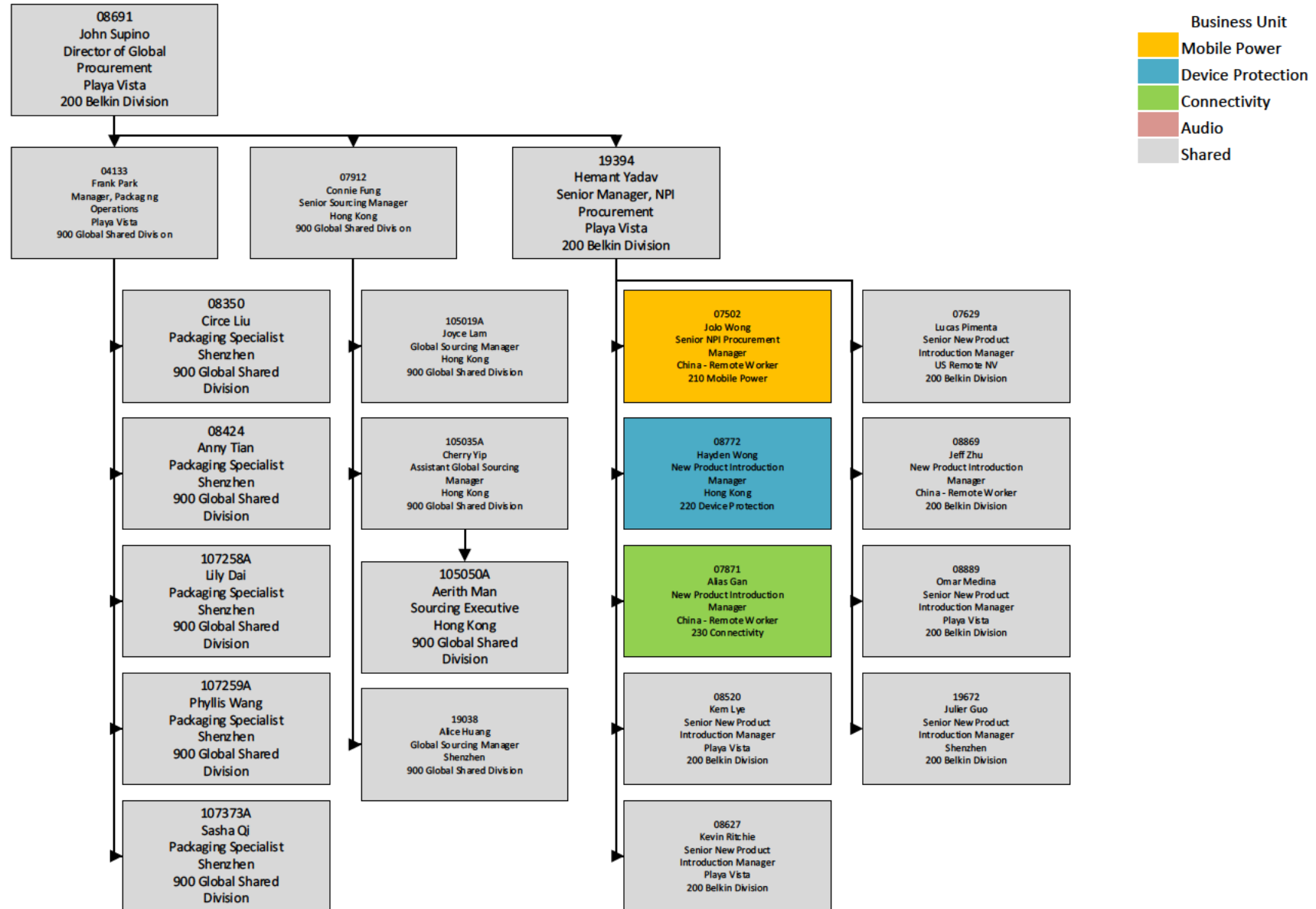
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Product Management-Regional and Shared



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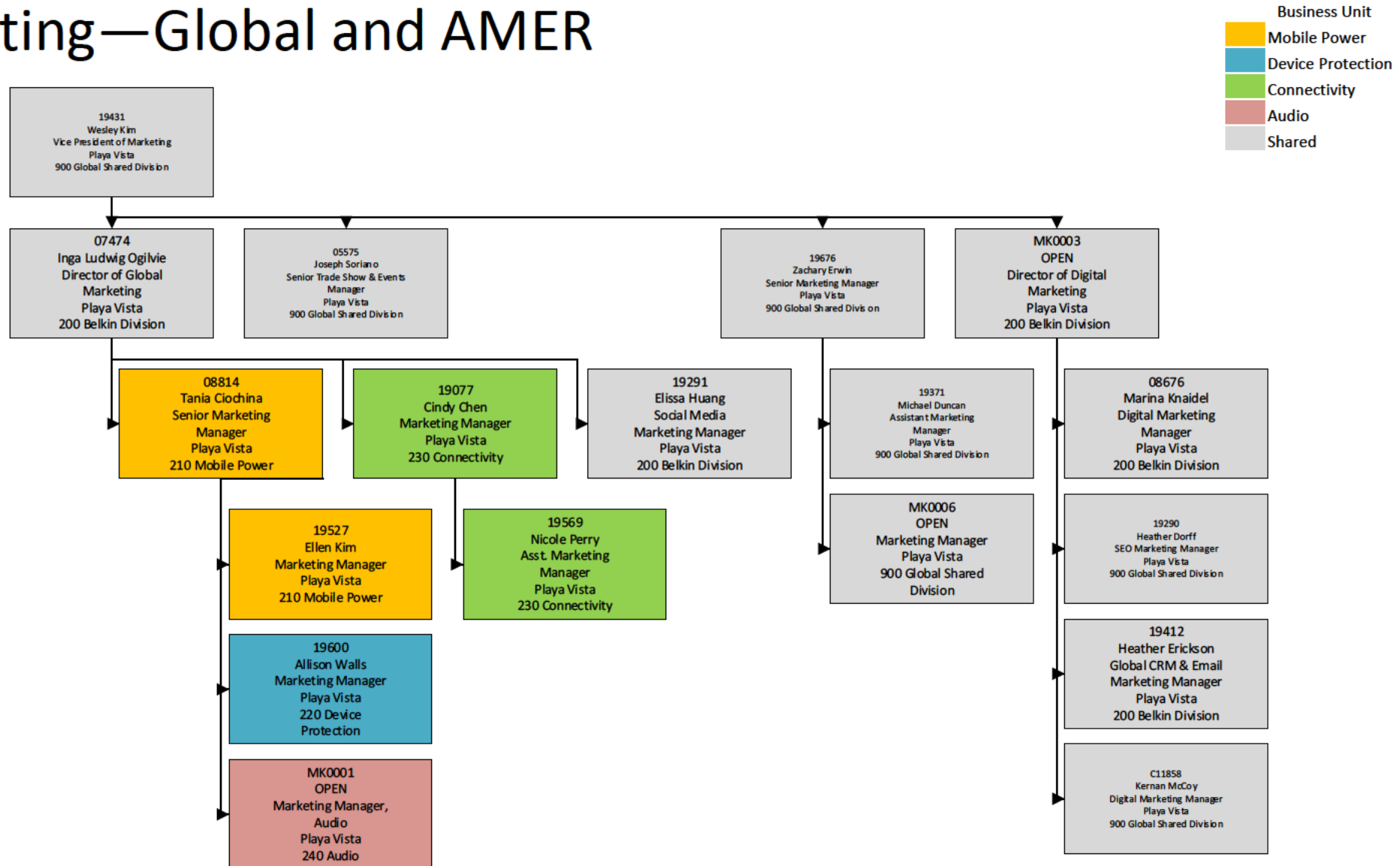
GSM



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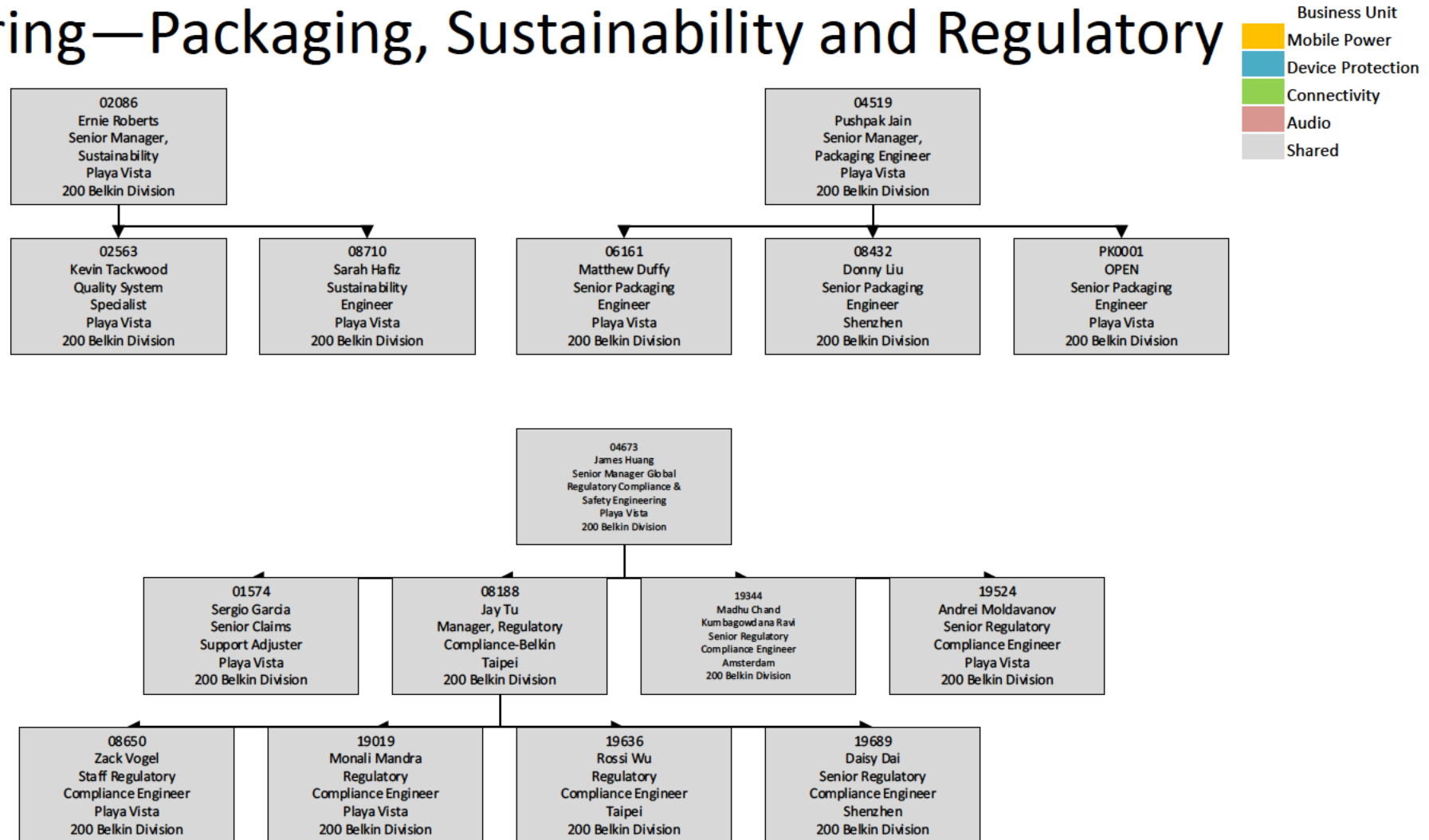
Marketing—Global and AMER



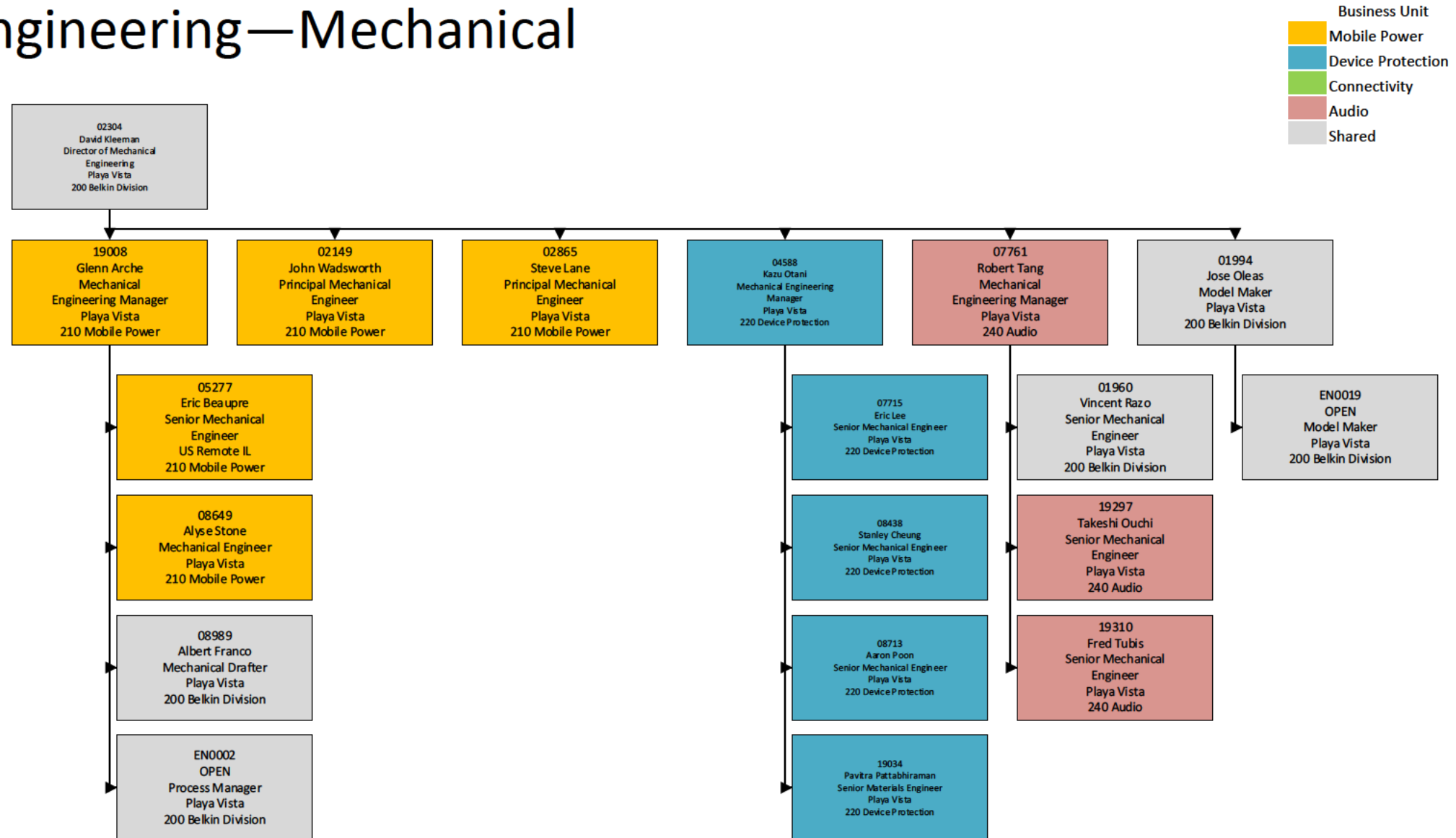
CONFIDENTIAL

BELKIN_000007

Engineering—Packaging, Sustainability and Regulatory

**CONFIDENTIAL****BELKIN_000008**

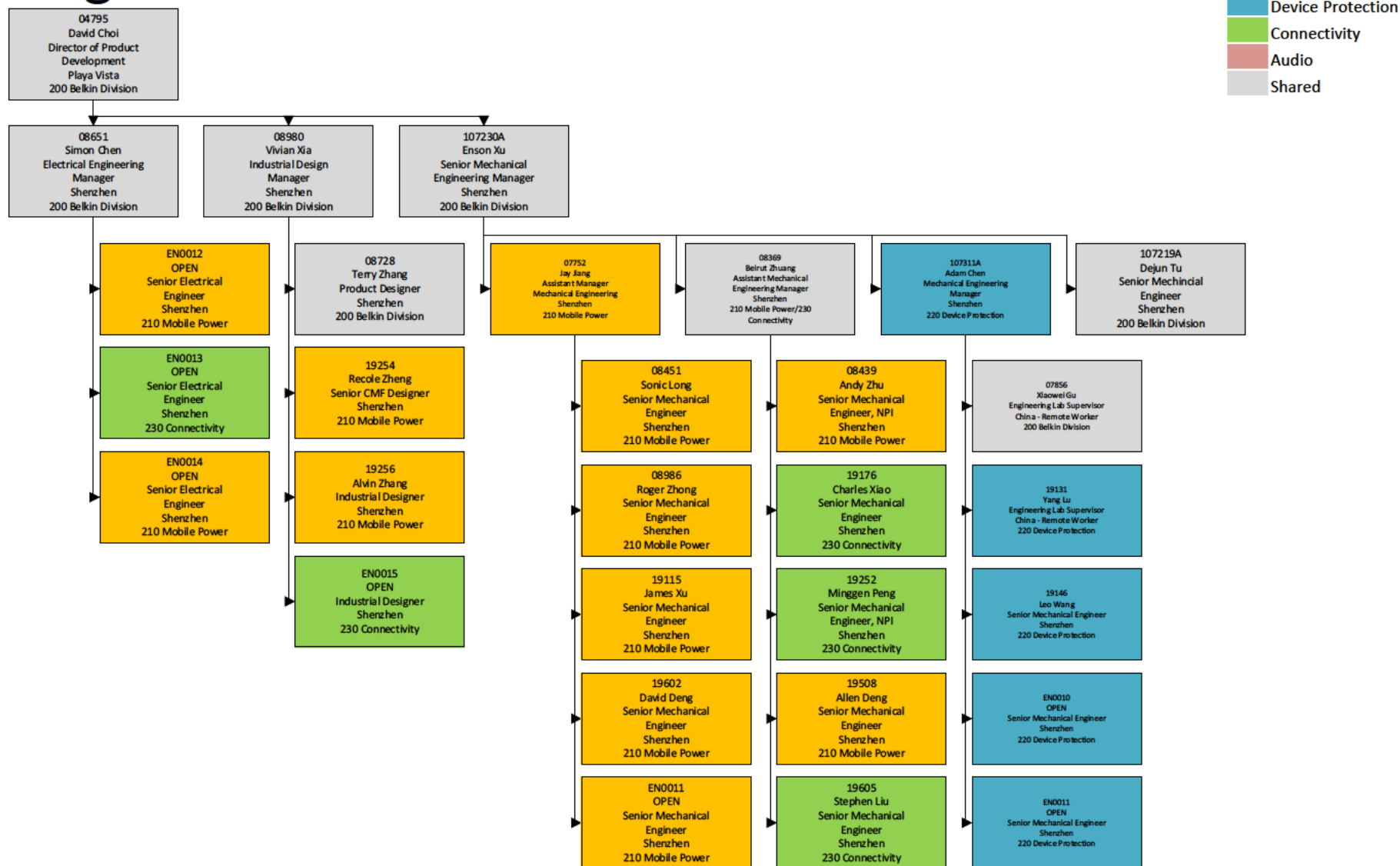
Engineering—Mechanical



CONFIDENTIAL

BELKIN_000009

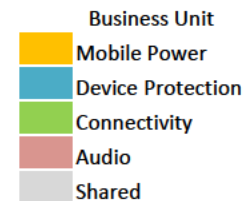
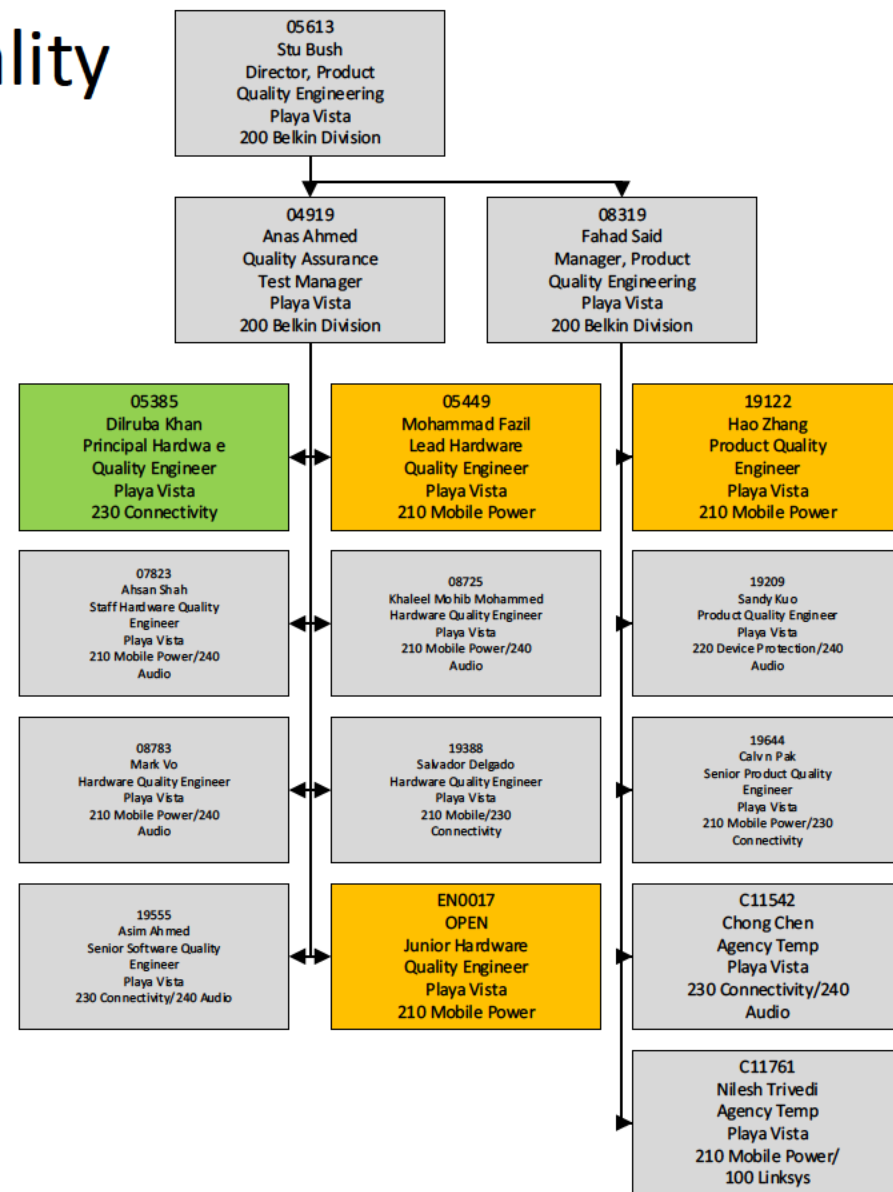
Engineering—PDG



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BELKIN_000010

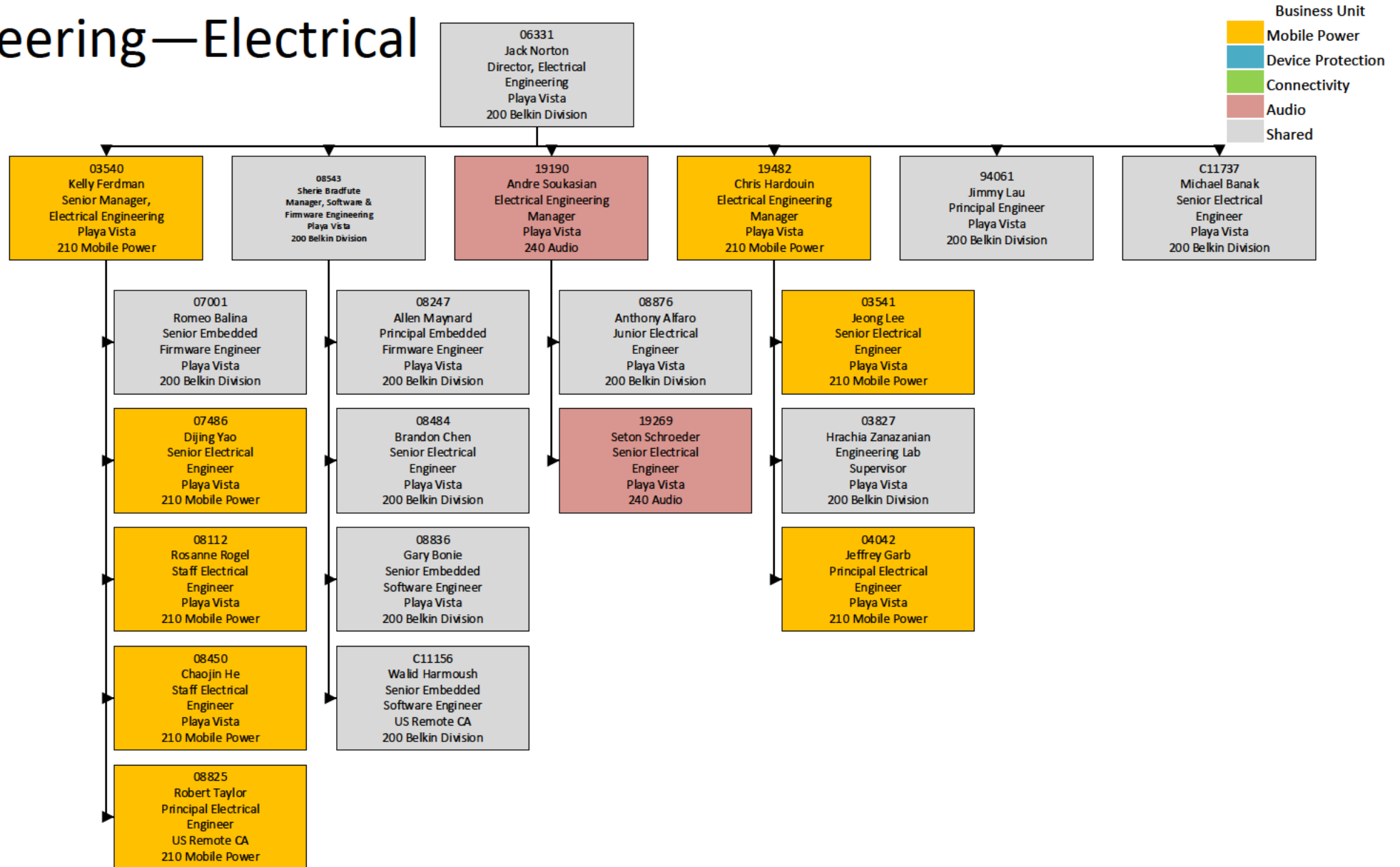
Engineering—Quality



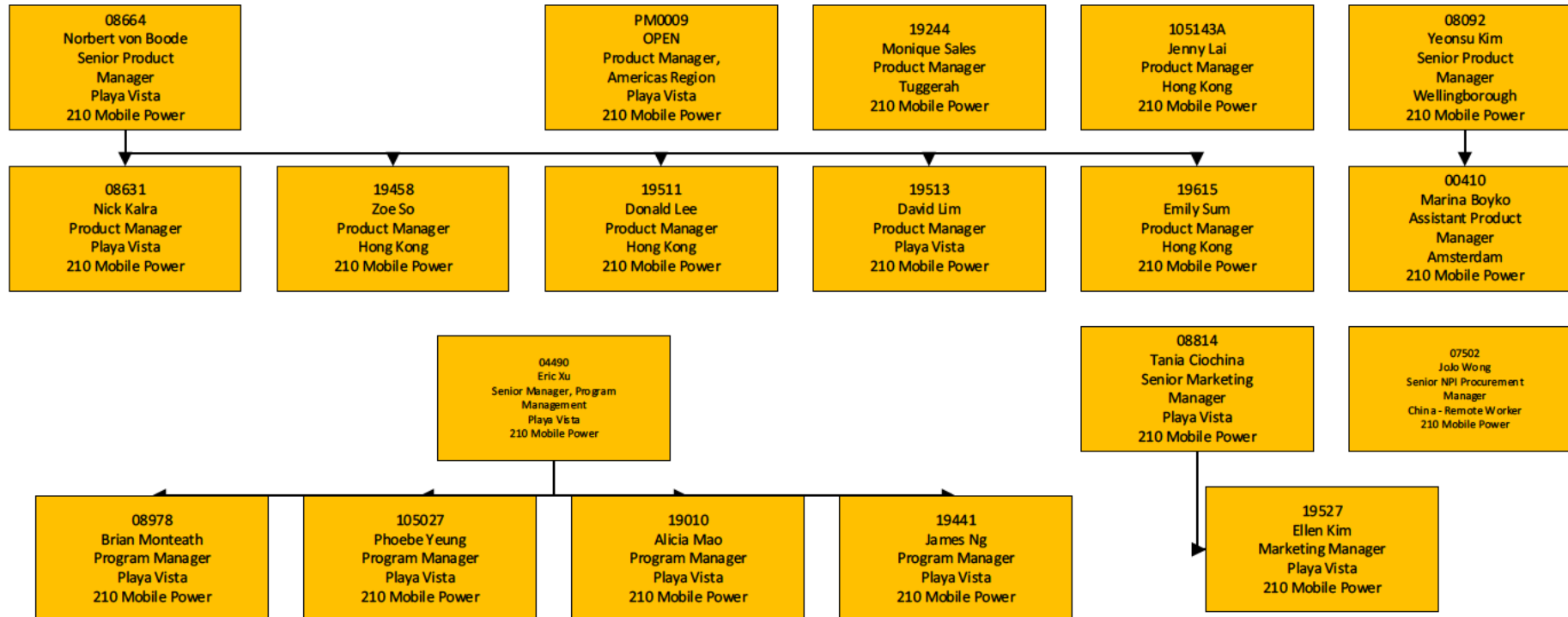
CONFIDENTIAL

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Engineering—Electrical



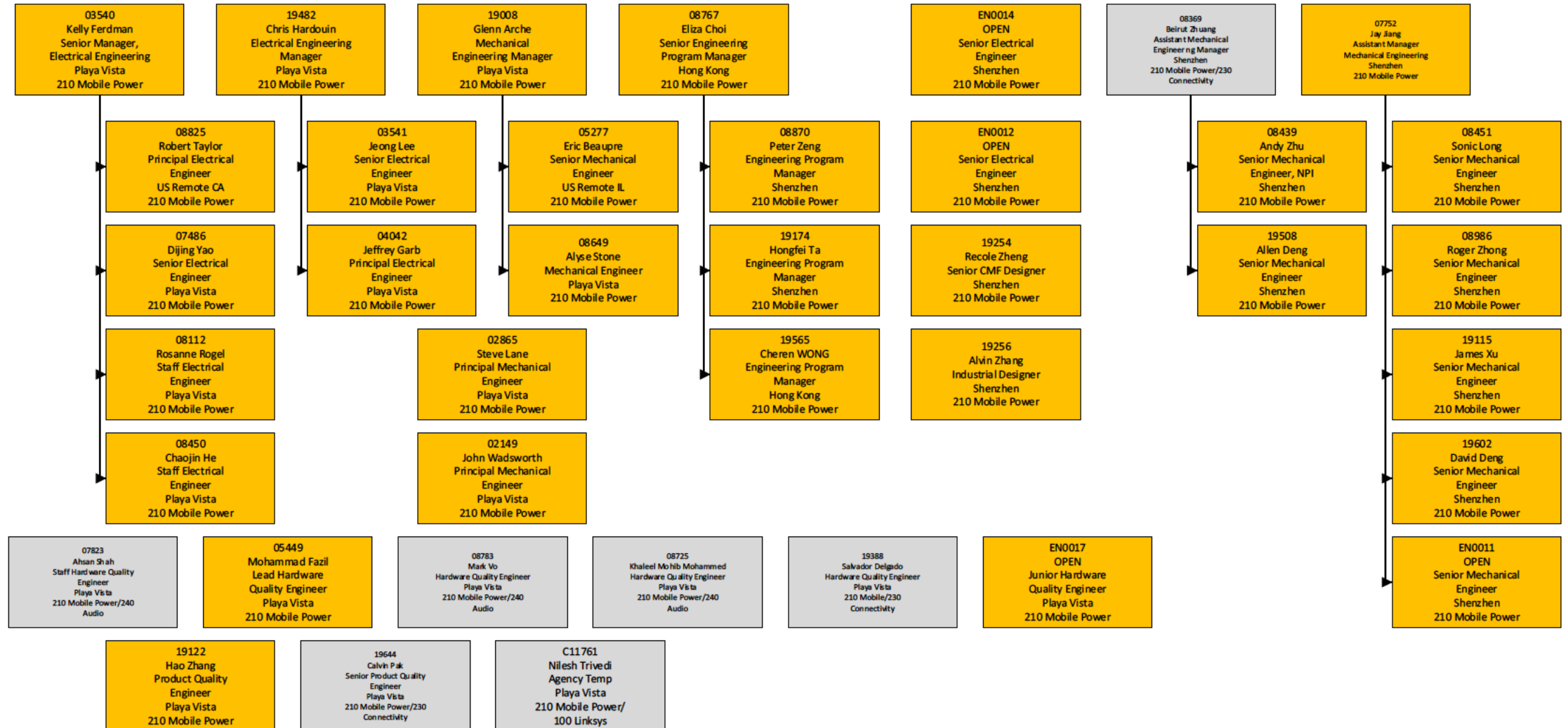
210 Mobile Power



CONFIDENTIAL

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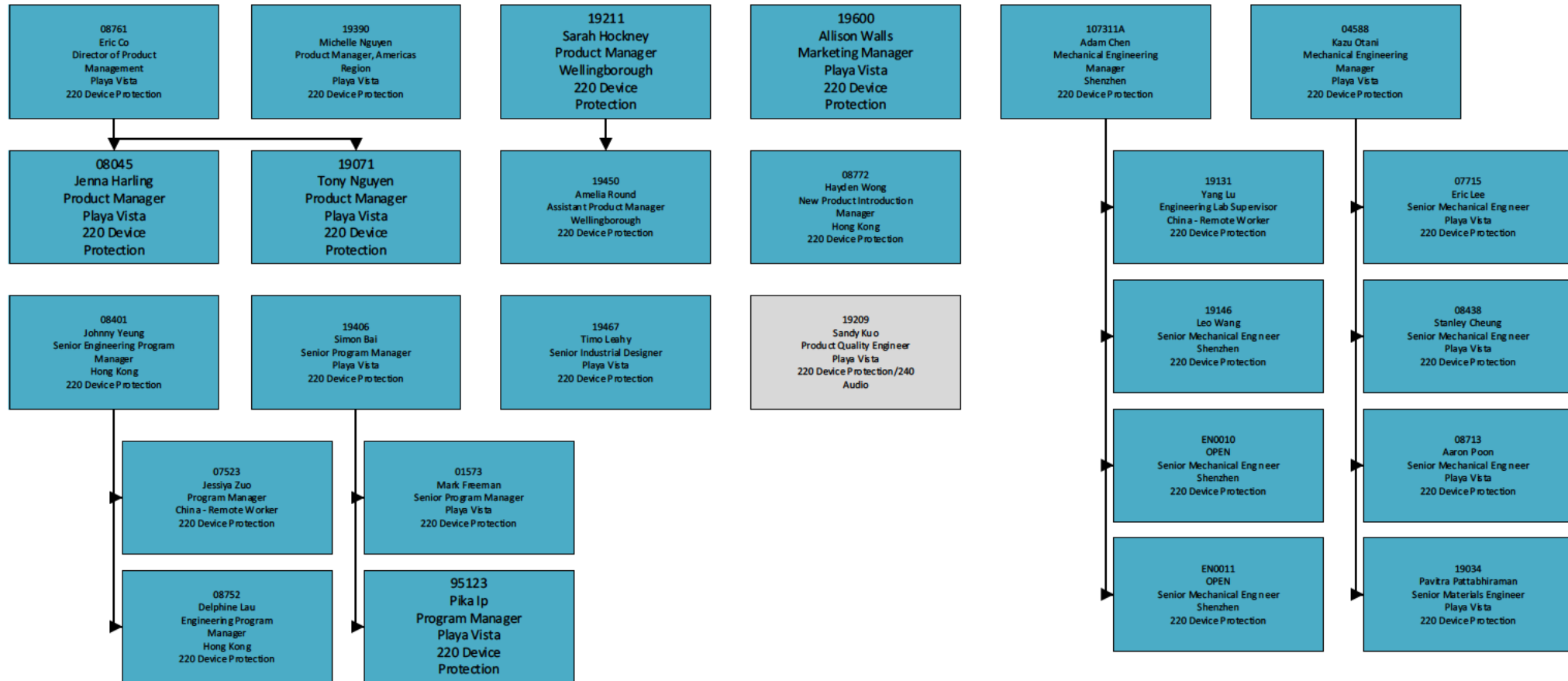
210 Mobile Power



CONFIDENTIAL

BELKIN_000014

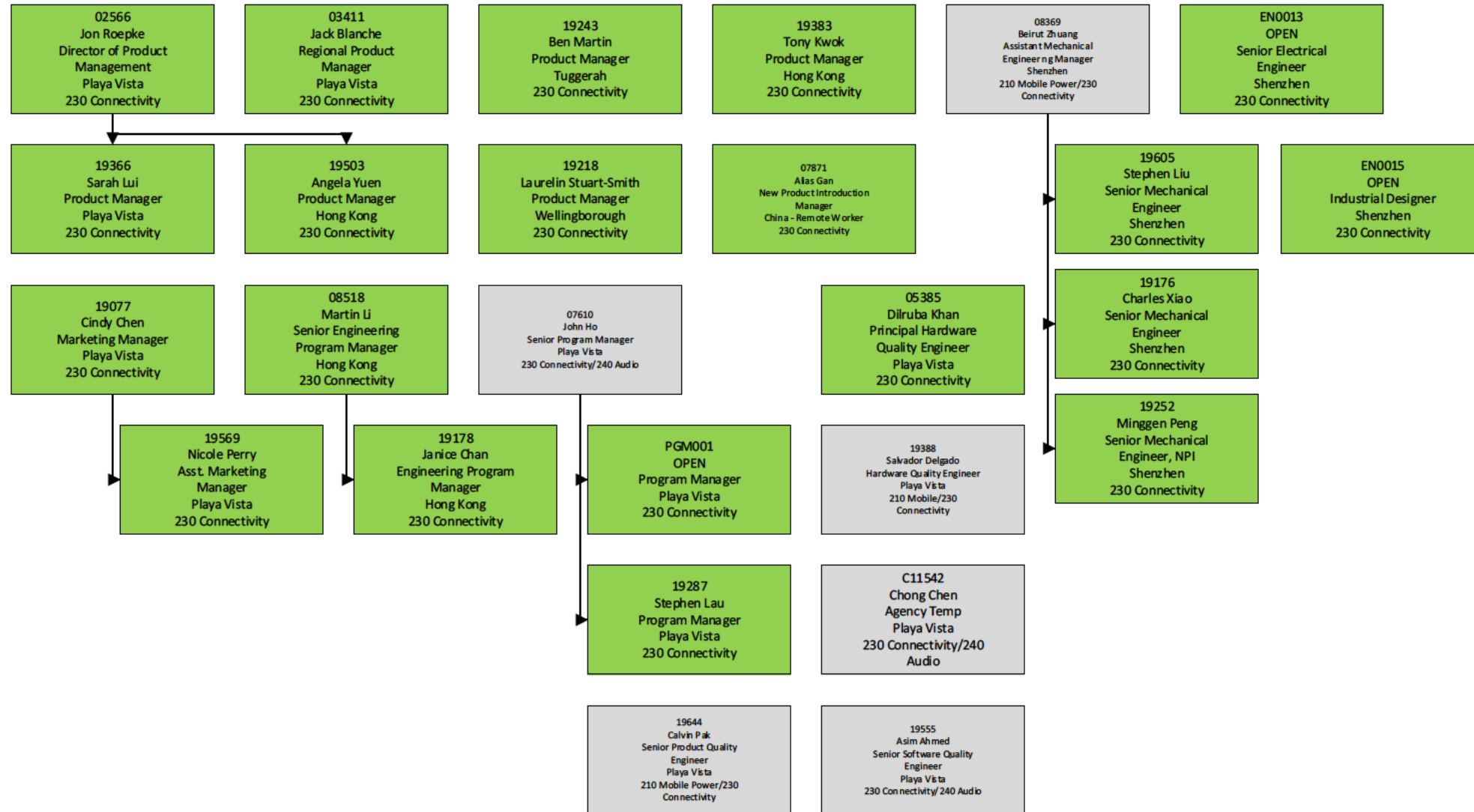
220 Device Protection



CONFIDENTIAL

BELKIN_000015

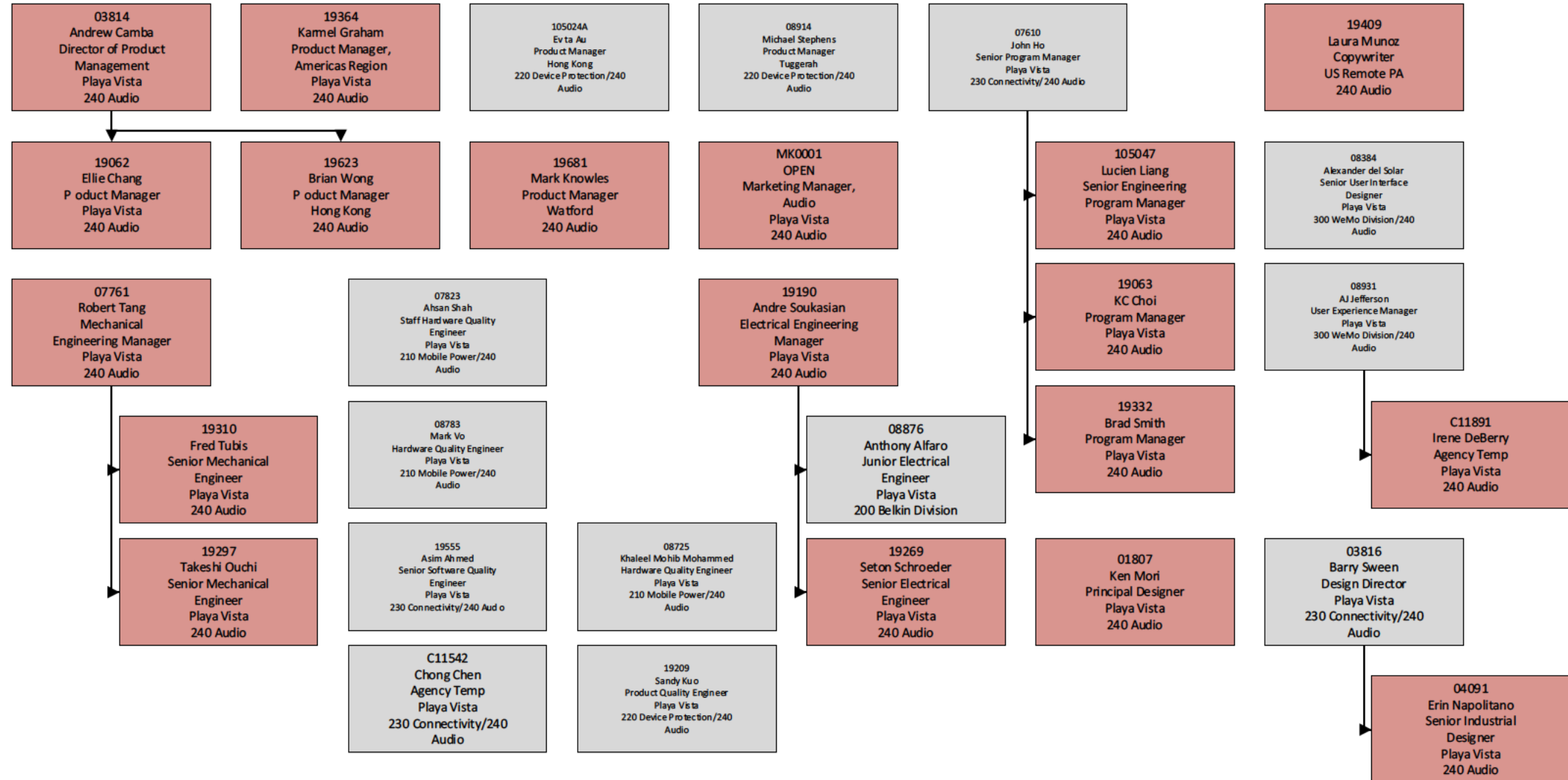
230 Connectivity



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BELKIN_000016

240 Audio




CONFIDENTIAL

BELKIN_000017

SKU#	F7U020btBLK/C00/SLV
Retail Box P#	8830bt24370 Rev. H00 8830bt24374 Rev. H00 8830bt24375 Rev. H00
UPC	745883738359/ 745883738366/ 745883739615 Ok mk 2/24/17
Language Code	bt
Compatibility Badge <i>English/French</i>	For/Pour Smartphones Tablets
Power Spec	[10,000 mAh ICON]
Usage Icon <i>English/French</i>	2 USB [Smartphone 3x ICON] Charge up to 3 times*
CEW	[\$2,500** €2,000** £1,500** CONNECTED EQUIPMENT WARRANTY™ Badge]
Product Name <i>English/French</i>	POCKET POWER 10K
Compatibility (right panel) <i>English/French</i>	Works with Smartphones Tablets Smart watches Fitness bands Headphones Speakers Action cameras Drones Bluetooth® enabled devices Add Color Swatch

Back Panel Icons	[CASE ICON] [FEATHER ICON] [12 W ICON] Add color waves: Rose Gold, Silver, Black
WTB <i>English/French</i>	Charge up to two devices with this powerful and lightweight power bank.
Back Panel <i>English/French</i>	Product Image w/ Callouts 2 universal USB ports (2.4A shared) quickly charge devices 2.0A micro-USB port quickly recharges battery 4 LED indicators show battery power level
Legal disclaimer <i>English/French</i>	*Charges iPhone 7 (running iOS 10) up to 3 times on a single charge in internal testing. **Belkin will repair or replace electronic devices damaged by an electrical charge while properly connected to this charger, up to \$2,500US/€2,000/£1,500. Visit belkin.com/cew for details.
Product Descriptor <i><English, French, German, Spanish, Italian, Portuguese, Polish, Russian, Swedish, Dutch, Hungarian, Serbian, Greek, Czech, Japanese, Korean, Simplified Chinese, Traditional Chinese, Arabic</i>	Battery Charger with Micro-USB Cable
Includes <i>English/French</i>	Includes 10,000 mAh Battery Pack, 6" Micro-USB Cable
Legal <i>English/French</i>	Rechargeable Li-Ion Battery Pack, Input: 5V 2.0A, Output: USB Port 5V 2.4A; Cell Capacity 10,000 mAh, 37.0Wh, 3.7V, 1INP11/66/110-1
Copyright <i>English/French</i>	© 2019 Belkin International, Inc. All rights reserved. All trade names are registered trademarks of respective manufacturers listed. iPhone is a trademark of Apple Inc., registered in the U.S. and other countries. The trademark "iPhone" is used in Japan with a license from Aiphone K.K.

Address	Belkin International, Inc. Los Angeles, CA 90094, USA Belkin Asia Pacific Ltd. Hong Kong Belkin Ltd. Express Business Park Shipton Way, Rushden NN10 6GL, United Kingdom Belkin BV. Herikerbergweg 74-108, 1101 CM, Amsterdam Z.O. The Netherlands Belkin Ltd. Tuggerah, Australia
China Legal	产品名称 : [Product Name here in Simplified Chinese] 经销商: 贝尔金贸易 (上海) 有限公司 地址 : 上海自由贸易试验区新灵路118号1407B室, 邮编 : 200131 委托制造商 : 本产品是由Belkin Asia Pacific Limited授权生产 地址 : 香港九龙九龙湾临泽街8号傲腾广场26楼01室
Japan Legal	カスタマーサポートセンター 0120-532-372 (フリーダイヤル) 携帯電話 : 03-5767-6029 (月-金 9:00-12:00, 13:00-17:00 祝日を除く) Eメール japansupport@belkin.com
Web Support	Belkin Tech Support: www.belkin.com/support
Warranty <i>English (Warranty Only), French, German, Spanish, Italian, Portuguese, Polish, Russian, Swedish, Dutch, Hungarian, Serbian, Greek, Czech, Korean, Simplified Chinese, Traditional Chinese, Arabic</i> <i>NOTE: Add "Made in China" in KR</i>	2-Year Limited Warranty. Made in China. SC: 中国广东省制造 TC: 中國廣東省製造
AU Warranty Re-direct <i>English/French</i>	Australian consumers, please see inside of the packaging for warranty details.
DIC Lockup <i>English/French</i>	Designed in California. Made in China. belkin.com

<p>RC / SUS Compliance certs <i>English/French</i></p>	<p>RCM CE EAC</p> <p>Intertek Energy Verification Marking</p>  <p>FCC INDOOR USE ONLY CEC BC Triman Korea PET Taiwan recycle (add statement) Japan recycle paper and plastic (add PE) Green dot WEEE Circle "10" KCC XU101568-18001A</p> <p>US Recycle logo. Recycling programs for this packaging may not exist in your area.</p>

SIDE A	
SKU#	F7U020btBLK/C00/SLV
Brand(s)	Belkin
Web Product Name	POCKET POWER 10K
For device:	Smartphones Tablets Smart watches Fitness bands Headphones Speakers Action cameras Drones Bluetooth®-enabled devices
Overview <i>Headline: Bold, All Caps</i> <i>Body Copy: 35-70 words</i>	CHARGE UP ANYWHERE 10,000 mAh can recharge a smartphone up to three times over, providing an additional 25 hours of call time or 21 hours of web browsing.* The thin and lightweight power bank fits comfortably in your bag or pocket so you can stay charged wherever you go. Two universal USB-A ports deliver up to 2.4 Amps to quickly and safely charge devices like smart watches, fitness bands, headphones, speakers, action cameras, and tablets rapidly. The 2.0-Amp input allows the battery to recharge quickly between uses, so you'll never be without power.
Marketing Information: <i>Relevant market info for sales purposes (new copy from CB)</i>	PRODUCT STORY <ul style="list-style-type: none"> Research: With the smartphone becoming even more essential in people's lives, not just as a means of communication, but as a camera, music player, navigation system, and Internet-access device, preventing low battery on the go is even more important for consumers.

	<ul style="list-style-type: none"> Consumer requirement: Lightweight and portable backup power that can safely charge a smartphone quickly and safely to significantly increase hours of use.
SIDE B	
Features <i>Bulleted Feature List (no periods)</i>	AT A GLANCE <ul style="list-style-type: none"> 10,000 mAh battery 2.4A total output quickly charges devices 2.0A total input recharges battery quickly 2x universal USB port Compact and thin design for portability 6" micro-USB cable recharges battery 4 LED indicators show battery power level Durable, plastic casing Belkin 6-Point Safety Checklist ensures the power bank is safe for you and your devices \$2,500 Connected Equipment Warranty**
Contents <i>Bulleted What's in the Box List (no periods)</i>	Package Includes: <ul style="list-style-type: none"> 10,000 mAh power bank, 6" micro-USB cable
Consumer Benefits: <i>3-6 based on Feature Set or Communication Hierarchy</i>	BENEFITS 2.4A = FAST CHARGING Two universal USB-A ports deliver a total of 2.4-Amp output so you can rapidly charge multiple devices. With a 2.0-Amp input, you can recharge the portable battery between uses quickly via a micro-USB port. Simply connect to a wall charger or other power supply using the micro-USB cable provided.

<p>Subheads: Bold, All Caps</p> <p>Body Copy: Sentence</p> <p>Use relevant icons</p>	<p>OH SO PORTABLE</p> <p>Beautiful slim design and lightweight components mean this power bank can fit right in your pocket or bag. Durable plastic casing keeps the internal circuit board safe as it travels with you. Powerful lithium battery cells are efficient and lightweight alternatives to traditional cells, making Pocket Power 10K even easier to transport.</p> <p>DUAL-PORT CHARGING <u>[replace with icon from pkg]</u></p> <p>Don't pick and choose what to charge. Two USB ports allow you to charge up to two devices at the same time so all your devices are always ready to go.</p> <p>THE SAFETY TRIANGLE</p> <p>Belkin batteries include sensors monitoring heat, voltage, and circuitry. Excess heat, voltage fluctuation, or circuit abnormalities activate an override that shuts the battery down, protecting it from the threat of overheating and extending its life.</p> <p>\$2,500 CONNECTED EQUIPMENT WARRANTY**</p> <p>**Product is covered by a \$2,500 Connected Equipment Warranty. This means we will repair or replace any equipment damaged by a surge, spike, or lightning strike while properly connected to our charger, up to \$2,500.</p>
<p>Available Colors:</p>	<p>Black, Silver, Rose Gold</p>
<p>[legal]</p>	<p>Rechargeable Li-Ion Battery Pack, Input: 5V 2.0A, Output: USB Port 5V 2.4A; Cell Capacity 10,000 mAh, 37.0Wh, 3.7V, INP11/66/110-1</p> <p>*Charges iPhone 7 (running iOS 10) up to three times on a single charge in internal testing.</p> <p>Additional battery life equates to 25 hours additional call time or 21 hours browsing using 3G Internet on iPhone 7 (running iOS 10), based on call time from a single charge (source: which.co.uk)</p>

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	<p>Belkin International Inc. Los Angeles, CA 90094, USA Belkin Ltd. Rushden, United Kingdom Belkin Ltd. Tuggerah, Australia</p>
--	---







POCKET POWER 10K

For Device:

- Smartphones
- Tablets
- Smart watches
- Fitness bands
- Headphones
- Speakers
- Action cameras
- Drones
- *Bluetooth*® enabled devices

CHARGE UP ANYWHERE

10,000 mAh can recharge a smartphone up to three times over, providing an additional 25 hours of call time or 21 hours of web browsing.* The thin and lightweight power bank fits comfortably in your bag or pocket so you can stay charged wherever you go. Two universal USB-A ports deliver up to 2.4 Amps to quickly and safely charge devices like smart watches, fitness bands, headphones, speakers, action cameras, and tablets rapidly. The 2.0-Amp input allows the battery to recharge quickly between uses, so you'll never be without power.

AT A GLANCE

- 10,000 mAh battery
- 2.4A total output quickly charges devices
- 2.0A total input recharges battery quickly
- 2x universal USB port
- Compact and thin design for portability
- 6" micro-USB cable recharges battery
- 4 LED indicators show battery power level
- Durable, plastic casing
- Belkin 6-Point Safety Checklist ensures the power bank is safe for you and your devices
- \$2,500 Connected Equipment Warranty**

PRODUCT STORY

- Research: With the smartphone becoming even more essential in people's lives, not just as a means of communication, but as a camera, music player, navigation system, and Internet-access device, preventing low battery on the go is even more important for consumers.
- Consumer requirement: Lightweight and portable backup power that can safely charge a smartphone quickly and safely to significantly increase hours of use.



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POCKET POWER 10K

For Device:

Smartphones

Tablets

Smart watches

Fitness bands

Headphones

Speakers

Action cameras

Drones

Bluetooth®-enabled devices

BENEFITS



2.4A = FAST CHARGING

Two universal USB-A ports deliver a total of 2.4-Amp output so you can rapidly charge multiple devices. With a 2.0-Amp input, you can recharge the portable battery between uses quickly via a micro-USB port. Simply connect to a wall charger or other power supply using the micro-USB cable provided.



THE SAFETY TRIANGLE

Belkin batteries include sensors monitoring heat, voltage, and circuitry. Excess heat, voltage fluctuation, or circuit abnormalities activate an override that shuts the battery down, protecting it from the threat of overheating and extending its life.



OH SO PORTABLE

Beautiful slim design and lightweight components mean this power bank can fit right in your pocket or bag. Durable plastic casing keeps the internal circuit board safe as it travels with you. Powerful lithium battery cells are efficient and lightweight alternatives to traditional cells, making Pocket Power 10K even easier to transport.



\$2,500 CONNECTED EQUIPMENT WARRANTY**

**Product is covered by a \$2,500 Connected Equipment Warranty. This means we will repair or replace any equipment damaged by a surge, spike, or lightning strike while properly connected to our charger, up to \$2,500.



DUAL-PORT CHARGING

Don't pick and choose what to charge. Two USB ports allow you to charge up to two devices at the same time so all your devices are always ready to go.



Package Includes:

- 10,000 mAh power bank, 6" micro-USB cable

Available Colors:

- Black, Silver, Rose Gold

SKU#: F7U020b+BLK, F7U020b+C00, F7U020b+SLV

Rechargeable Li-Ion Battery Pack, Input: 5V 2.0A, Output: USB Port 5V 2.4A; Cell Capacity 10,000 mAh, 37.0Wh, 3.7V, INP11/6/110-1
 *Charges iPhone 7 (running iOS 10) up to three times on a single charge in internal testing.
 Additional battery life equates to 25 hours additional call time or 21 hours browsing using 3G Internet on iPhone 7 (running iOS 10), based on call time from a single charge (source: which.co.uk)
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Date: May 03, 2017

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TEST REPORT

<u>Applicant:</u>	Belkin International Inc.
<u>Address:</u>	12045 East Waterfront Drive, Playa Vista, CA 90094, USA
<u>Product:</u>	Rechargeable Li-ion Battery Pack
<u>Model:</u>	F7U020
<u>Trade Name:</u>	belkin
<u>Rating:</u>	Input: 5Vdc, 2A Output: 5Vdc, 2.4A (each port 2.4A max.)
<u>Sample receipt date:</u>	April 25, 2017
<u>Date of Performance of Test:</u>	April 26, 2017 – April 27, 2017
<u>Organization performing the test:</u>	Intertek Testing Services Taiwan Ltd. 5F, 423, Ruiguang Road, Neihu District, Taipei 114, Taiwan.
<u>Testing Requirement:</u>	CEC-400-2015-021, Table W-2: Standards for Small Battery Chargers Systems according to 10 CFR Section 430.23(aa) (Appendix Y to Subpart B of Part 430)
<u>Conclusion:</u>	From the results of our testing on the submitted sample(s), we are of the opinion that the submitted sample(s) COMPLY WITH CEC-400-2015-021 Table W-2 requirements for Small Battery Chargers Systems

Intertek Testing Services Taiwan Ltd.

Prepared by:

Hank Chou
Project Engineer

Prepared by:

Jason Chen
Senior Engineer



Report No.: 170400387TWN-001

Date: May 03, 2017

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Remark:

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General Technical Information:

1. UUT manufacturer:

SHENZHEN DBK ELECTRONICS CO., LTD

1st-5th floor Building 1, Jinyuan company Longhua Industrial Park, the north of Longguan Rd Hualian Community, Longhua Town, 518109 Baoan District, Shenzhen, Guangdong, China

2. UUT model no. and serial no.:

F7U020 (serial no.: N/A)

3. Manufacturer and model number of battery charger

N/A

4. Manufacturer, model no. and serial no. of battery

DBK, 1166110 (serial no.: N/A)

5. Standard size or type of battery

Li-ion Battery

6. Number of batteries employed in the test

2

7. Battery chemistry

Li-ion Battery

8. Rated battery voltage (V)

5 Vdc

9. Rated battery capacity (Ah or mAh)

6070 mAh

10. Any information provided by the manufacturer regarding access to the battery, particular safety requirements, etc.

N/A

11. Whether the battery charger system is detachable, integral, swappable, or does not meet any of these definitions.

Integral

12. Whether the battery charger system includes a cradle.

No

13. Other functionality of battery charger

N/A



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Test Result:

	Measured Value	Mean	UCL/1.05	Represented Value
1. Duration of the charge and maintenance mode test, t _{cd} (hrs)	24	-		24
2. Battery discharge energy, E _{batt} (Wh)	Sample A: 32.01 Sample B: 31.88	31.95		31.95
3. Battery maintenance mode power, P _m (W)	Sample A: 0.10 Sample B: 0.10	0.10		0.10
4. 24 hour charger and maintenance energy, E ₂₄ (Wh)	Sample A: 47.92 Sample B: 47.50	47.71		47.71
5. Standby mode power, P _{sb} (W)	-	-		-
6. No battery mode power (W)	-	-		-
7. Off mode power, P _{off} (W)	-	-		-
8. Unit Energy Consumption, UEC(kWh/yr)	Sample A: 0.73 Sample B: 0.72	0.73	0.75	0.75
9. Ambient:	Temperature: 24 °C			



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Date: May 03, 2017

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Small Charger Proposed Regulations:

<u>Performance Parameter</u>	<u>Standard</u>
<u>Maximum 24 hour charge and maintenance energy (Wh)</u> <u>(E_b = capacity of all batteries in ports and N = number of charger ports)</u>	<u>For E_b of 2.5 Wh or less:</u> <u>16 × N</u>
	<u>For E_b greater than 2.5 Wh and less than or equal to 100 Wh:</u> <u>12 × N + 1.6E_b</u>
	<u>For E_b greater than 100 Wh and less than or equal to 1000 Wh:</u> <u>22 × N + 1.5E_b</u>
	<u>For E_b greater than 1000 Wh:</u> <u>36.4 × N + 1.486E_b</u>
<u>Maintenance Mode Power and No Battery Mode Power (W)</u> <u>(E_b = capacity of all batteries in ports and N = number of charger ports)</u>	<u>The sum of maintenance mode power and no battery mode power must be less than or equal to:</u> <u>1 × N + 0.0021 × E_b Watts</u>



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Date: May 03, 2017

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Summary of test results:

When tested at 5 Vdc:

Total charger input energy is 47.71 **Wh**, less than 63.12 **Wh**.

The sum of Maintenance Power and No Battery Power is 0.10 **W**, less than 1.07 **W**.

The results only relate to the item tested



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Photos of the appliance:

External view





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Date: May 03, 2017
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Equipment List

Reg. No.	Equipment Name	Brand Name	Type / Model	Cal. Date	Next Cal.
RL024	DC Power Source	Chroma	62006P	-	-
EC0223	Power Analyzer	N4L	PPA2530	2016/05/25	2017/05/24
EC0315	Battery Test Machine	GWINSTEK	GBT-2211	2016/10/18	2017/10/17



Report No.: 170400381TWN-001

Date: May 03, 2017

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TEST REPORT

<u>Applicant:</u>	Belkin International Inc.
<u>Address:</u>	12045 East Waterfront Drive, Playa Vista, CA 90094, USA
<u>Product:</u>	Rechargeable Li-ion Battery Pack
<u>Model:</u>	F7U020
<u>Trade Name:</u>	belkin
<u>Rating:</u>	Input: 5Vdc, 2A Output: 5Vdc, 2.4A (each port 2.4A max.)
<u>Sample receipt date:</u>	April 25, 2017
<u>Date of Performance of Test:</u>	April 26, 2017 – April 27, 2017
<u>Organization performing the test:</u>	Intertek Testing Services Taiwan Ltd. 5F, 423, Ruiguang Road, Neihu District, Taipei 114, Taiwan.
<u>Testing Requirement:</u>	EERE-2008-BT-STD-0005-0256: Energy Conservation Standards for Battery Chargers according to 10 CFR Section 430.23(aa) (Appendix Y to Subpart B of Part 430)
<u>Conclusion:</u>	From the results of our testing on the submitted sample(s), we are of the opinion that the submitted sample(s) COMPLY WITH EERE-2008-BT-STD-0005-0256 requirements for Battery Chargers

Intertek Testing Services Taiwan Ltd.

Prepared by:

Hank Chou
Project Engineer

Prepared by:

Jason Chen
Senior Engineer



Report No.: 170400381TWN-001

Date: May 03, 2017

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- 4) When determining the test conclusion, the Measurement Uncertainty of test has been considered.

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General Technical Information:

1. UUT manufacturer:	SHENZHEN DBK ELECTRONICS CO., LTD 1st-5th floor Building 1, Jinyuan company Longhua Industrial Park, the north of Longguan Rd Hualian Community, Longhua Town, 518109 Baoan District, Shenzhen, Guangdong, China
2. UUT model no. and part no.:	F7U020 (serial no.: N/A)
3. Manufacturer and model number of battery charger	N/A
4. Manufacturer, model no. and serial no. of battery	DBK, 1166110 (serial no.: N/A)
5. Standard size or type of battery	Li-ion Battery
6. Number of batteries employed in the test	2
7. Battery chemistry	Li-ion Battery
8. Rated battery voltage (V)	5 Vdc
9. Rated battery capacity (Ah or mAh)	6070 mAh
10. Any information provided by the manufacturer regarding access to the battery, particular safety requirements, etc.	N/A
11. Whether the battery charger system is detachable, integral, swappable, or does not meet any of these definitions.	Integral
12. Whether the battery charger system includes a cradle.	No
13. Other functionality of battery charger	N/A



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Test Result:

	Measured Value	Mean	UCL/1.05	Represented Value
1. Duration of the charge and maintenance mode test, t _{cd} (hrs)	24	-		24
2. Battery discharge energy, E _{batt} (Wh)	Sample A: 32.01 Sample B: 31.88	31.95		31.95
3. Battery maintenance mode power, P _m (W)	Sample A: 0.10 Sample B: 0.10	0.10		0.10
4. 24 hour charger and maintenance energy, E ₂₄ (Wh)	Sample A: 47.92 Sample B: 47.50	47.71		47.71
5. Standby mode power, P _{sb} (W)	-	-		-
6. No battery mode power (W)	-	-		-
7. Off mode power, P _{off} (W)	-	-		-
8. Unit Energy Consumption, UEC(kWh/yr)	Sample A: 0.73 Sample B: 0.72	0.73	0.75	0.75
9. Ambient:	Temperature: 24 °C			

Unit Energy Consumption Calculation

$$UEC = 365(n(E_{24} - 5P_m - E_{batt})\frac{24}{t_{cd}} + (P_m(t_{a\&m} - (t_{cd} - 5)n) + (P_{sb}t_{sb}) + (P_{off}t_{off})))$$

TABLE 5.3 – BATTERY CHARGER USAGE PROFILES

Product Class				Active + Maintenance ($t_{a\&m}$)	Standby (t_{sb})	Off (t_{off})	Charges (n)	Threshold Charge Time*
#	Description	Rated Battery Energy (E_{batt})**	Special Characteristic or Battery Voltage	Hours per Day***			Number per Day	Hours
1	Low-Energy	≤ 5 Wh	Inductive Connection ****	20.66	0.10	0.00	0.15	137.73
2	Low-Energy, Low-Voltage	< 100 Wh	< 4 V	7.82	5.29	0.00	0.54	14.48
3	Low-Energy, Medium-Voltage		$4 - 10$ V	6.42	0.30	0.00	0.10	64.20
4	Low-Energy, High-Voltage		> 10 V	16.84	0.91	0.00	0.50	33.68
5	Medium-Energy, Low-Voltage	$100 - 3000$ Wh	< 20 V	6.52	1.16	0.00	0.11	59.27
6	Medium-Energy, High-Voltage		≥ 20 V	17.15	6.85	0.00	0.34	50.44
7	High-Energy	> 3000 Wh	-	8.14	7.30	0.00	0.32	25.44

* If the duration of the charge test (minus 5 hours) as determined in section 5.2 of appendix Y to subpart B of this part exceeds the threshold charge time, use equation (ii) to calculate UEC otherwise use equation (i).
 ** E_{batt} = Rated battery energy as determined in 10 CFR Part 429.39(a)
 *** If the total time does not sum to 24 hours per day, the remaining time is allocated to unplugged time, which means there is 0 power consumption and no changes to the UEC calculation needed.
 **** Inductive connection and designed for use in a wet environment (e.g. electric toothbrushes)

UEC is greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$$

(B) The upper 97.5-percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.975} \left(\frac{s}{\sqrt{n}} \right)$$



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Energy Conservation Standards for Battery Chargers:

Product class	Product class description	Battery energy	Special characteristic or battery voltage	Adopted standard as a function of battery energy(kWh/yr)
1	Low-Energy	≤5 Wh	Inductive Connection in Wet Environments	3.04
2	Low-Energy, Low-Voltage	<100 Wh	<4 V	$0.1440 * E_{batt} + 2.95$
3	Low-Energy, Medium-Voltage		4-10 V	For $E_{batt} < 10\text{Wh}$, $UEC = 1.42 \text{ kWh/yr}$ For $E_{batt} \geq 10 \text{ Wh}$, $UEC = 0.0255 * E_{batt} + 1.16$
4	Low-Energy, High-Voltage		>10 V	$0.11 * E_{batt} + 3.18$
5	Medium-Energy, Low-Voltage	100-3000 Wh	<20 V	$0.0257 * E_{batt} + .815$
6	Medium-Energy, High-Voltage		≥20 V	$0.0778 * E_{batt} + 2.4$
7	High-Energy	>3000 Wh		$0.0502 * E_{batt} + 4.53$



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Summary of test results:

When tested at 5 Vdc:

The Unit Energy Consumption (UEC) is 0.75 kWh/yr, less than 1.97 kWh/yr.

The results only relate to the item tested



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Photos of the appliance:

External view





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Equipment List

Reg. No.	Equipment Name	Brand Name	Type / Model	Cal. Date	Next Cal.
RL024	DC Power Source	Chroma	62006P	-	-
EC0223	Power Analyzer	N4L	PPA2530	2016/05/25	2017/05/24
EC0315	Battery Test Machine	GWINSTEK	GBT-2211	2016/10/18	2017/10/17



Worm2 Battery
Pack

Hardware Quality
Assurance

This "Test Plan" contains information of a confidential and/or proprietary nature. Neither this "Test Plan" nor any of the information contained herein may be reproduced, used or disclosed to or for the benefit of any other person or entity without the express written consent of Belkin International Inc.

Product
Test Plan

<Worm 2> Test Plan

1. REVISION HISTORY

Ref#	Date	Activity	Made By	Version Number
1	01/3017	Initial draft	Ahsan Shah	1.0

2. References

Ref#	Agile Document Number	Document Name	Document Type	Version Used
1		Worm 2 PRD	Doc	1.0

<Worm 2> Test Plan

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4.....	TESTING SCOPE	6
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4.1.1	Power Charging:.....	7
4.1.2	LED:.....	Error! Bookmark not defined.
4.1.3	Mechanically Design:.....	Error! Bookmark not defined.
4.1.4	Power Supply:.....	Error! Bookmark not defined.
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<Worm 2> Test Plan

3. OVERVIEW

3.1 Introduction

Product Information

General

Product Type:	Battery pack
Product Name:	10000mAh mobile battery pack
Brand Name:	Belkin
Chip Set:	Undefined

Hardware

Component 1 Name:	2x USB-A 2.4A output port shared
Component 2 Name:	1x Micro USB input port
Component 2 Name:	

<Worm 2> Test Plan

3.2 Project Scope

This test plan is geared towards testing the full functionality of the **Worm 2** developed by Belkin. As information regarding subsequent releases and functionality within is not yet available, the test plan scope is limited to testing for planned functionality of the initial release.

3.3 Test Approach

We plan to create additional test documentation detailing the test activities performed under each of the following test types (Functional, performance, interoperability, etc.). The test documentation shall be reviewed by QA, Development, and Product teams locally and offshore to ensure adequate coverage. The goal is to layout test resources and artifacts to perform adequate testing as the system progress through development.

Quality Engineering for SW and HW will be engaged throughout the program and continuously updating test automation capabilities as new functions/features are made available by the engineering team (roughly every two weeks).

In conjunction with this effort, HWQA will be involved in a round of EVT testing which may include benchmark testing of competitor samples to design for quality. In addition, there will be one (1) formal round of DVT and one (1) PVT cycle performed with the completion of major milestones. Each test cycle is currently scheduled roughly **30** calendar days apart and consists of core services (HW) for test cycle 1, core business logic and inter-component communication and interoperability for test cycle 2, and final user experience/user interface layers implemented for test cycle 3

3.4 Schedule

Task Name	Duration
HWQA Test Plan	1 day
Review QA documentation provided by vendors	1 day
QA Test Specification	3 days
QA EVT 1 Test	12 days
Test Report	1 day
QA DVT 1 Test	12 days
Test Report	1 day
QA DVT 2 Test	12 days
Test Report	1 day
QA PVT Test	12 days
Test Report	1 day

<Worm 2> Test Plan

4. Testing Scope

Various types of testing will be conducted to achieve the desired test coverage for the **Worm 2 Battery pack**. The following list includes the types of testing which will be executed and the system components they exercise.

4.1 Functional

This is system level testing based on system components/interfaces and the goal here is to ensure that the system functions per its specifications. The system will not be subjected to any extreme conditions.

DUT will be tested for following Key Product Features:

	Worm 2
Battery Capacity	10000 mAh
Battery Type	Cylindrical
Output Port (1)	USB A receptacle 12W shared
Output Port (2)	USB A receptacle 12W shared
Input Port	5V/2A
Output Current (Port 1)	2.4A shared
Output Voltage (Port1)	5V
Output Power (Port1)	12 Watts
Output Current (Port 2)	2.4A shared
Output Voltage (Port 2)	5V
Output Power (Port 2)	12 Watts
Input Port (1)	Micro USB
Input Voltage	5V
Input current	Up to 2A
Input Power (Port 1)	10W
Connectivity	Must be designed to be compatible with iOS & Android devices

<Worm 2> Test Plan

4.1.1 Electrical & USB Spec:

1. DUT will be tested for Charging. Charge profiles should be captured for current and voltage with full load and actual compatible load.
2. DUT will be tested for discharging. Discharge profiles should be captured for current and voltage for full load (12W) and actual compatible loads such as 7/7plus/8/8plus and X, iPads 9 and 12-inch, Android phones (see PRD for compatibility list)
3. DUT will be tested for Input and Output Specified Voltage and Current Requirements.
4. DUT will be tested for Battery Capacity Requirements.
5. DUT will be tested for Compatibility Requirements for Mobile Devices.
6. DUT will be tested for battery Temperature Requirements per Thermal specifications PD-25722 Belkin HWQA Thermal testing procedure.
7. Battery should auto-sleep/Shut down If no activity is detected on the USB-A port (less than XXX mA, see EE spec)
8. DUT will be tested for priority charging. When the product is connected to a charging input, the output will charge the phone/tablet as priority. Once the phone is fully charged, the battery pack will start charging. Voltages at USB-A or C port should comply with USB spec. See PRD for more info
9. Battery pack should have OCP as per product specifications. USB-A should have OCP of <2.9A
10. Efficiency of battery pack should be above 80 or per EE spec
11. DUT will be tested for Auto-start feature. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.
12. DUT will be tested for Auto-sleep feature. If not activity is detected on the USB-A port (less than XXX mA, see EE spec), the battery pack will go into sleep-mode. The USB ports will turn off.
13. Both USB-A should be able to charge connected devices simultaneously

4.2 Reliability

This section is typically provided by the PQE team. See RTS details.

4.3 Compatibility (Internationalization)

All iOS & Android devices

<Worm 2> Test Plan

4.4 Performance

Worm 2 will be tested for a long duration. It should not get overheated under the ambient and operating temperature.

Enclosure temperature must not exceed 25C above ambient temperature during full operation.

4.5 Integration

<Assuming this system (or a sub component) integrates with another Belkin or industry system or device, list the system components and a list of integration tests and test areas applicable which you plan to design and execute >

4.6 Unit (Component Level)

TBD.

5. Entry/Exit Criteria

QA expects the following to be true before the system or a component within is handed over for certification:

Entry

- Component/system is accompanied with release notes detailing changes and new features
- QA should have all the required Product specification documents from Program Manager.
- Product Manager needs to provide QA the list of Compatible Devices that they will claim this product to work with on the Packaging.
- Product Manager needs to provide QA a draft version of the QIG/Packaging for review during DVT cycle and the final version during PVT for final review before launching.
- QA expect Program Manager to provide QA the Vendor's Test Spec for review and then QA will provide feedbacks and add more test cases to Vendor's Test Spec so that the Vendor will execute the Test Spec and provide QA their Test Results.
- The system is available for testing for the full domain of the testing cycle
- The QA environment is running in working condition
- The system has includes test data or QA has the ability to create it rapidly
- Requested samples highlighted in the Sample Plan are available to QA for testing

Exit

- High level test report

<Worm 2> Test Plan

- Detailed test report

6. Quality Engineering Risks

7. Benchmarking

8. Certifications

9. Environment and Tools

- iPhones 7/7plus/8/8plus/X and iPad Pro 9 and 12” models
- DC Load
- Apple LTG receptacle board
- Micro USB cable
- Power supply
- LTG cables
- Oscilloscope
- Thermal Imager

10. Resources

Type	Location	Company	Name	# people	Function
System Test Manager	Playa Vista	Belkin International Inc. USA	Anas Ahmed	1	Manager
Test Engineer	Playa Vista	Belkin International Inc. USA	Ahsan Shah	1	Tester

<Worm 2> Test Plan

11. Glossary and Definitions

<List acronyms and terms which are used in this document and their meaning or what they stand for>

Ref#	Term	Meaning / Stands for
1	DUT	Device Under Test
2	UUT	Unit Under Test
3	QE	Quality Engineer
4	QA	Quality Assurance
5	DVT	Design Verification Testing
6	EVT	Engineering Verification Testing
7	PVT	Production Validation Testing
8	HW	Hardware
9	SW	Software

QA Certification Report

Executive Test summary:

Test Execution %:	100
Quality Level %:	100

Release Recommendation:

Vendor Release to Production/Customer Recommendation:	Pass
---	------

Product Information:

<The table below should include one product only>

Product name:	10000 mAh Li Polymer Battery Pack
SKU ID:	Not available
Hardware Version:	To be provided by Vendor
Software Version:	n/a
Firmware Version:	n/a
Firmware Build Date:	n/a
Board Information	To be provided by Vendor
SKU Vendor	DBK

Test Cycle:

Project Name:	Worm 2
Test Cycle:	DVT1
Test Cycle Start Date:	4/11/2017
Test Cycle End Date:	4/314/2017
Tested By:	Mike
Number of Test Samples:	9

Detailed Test summary:

<list test results here split into category>

Number of Tests Planned:	16
Number of Tests Executed:	16
Number of Tests Failed:	0
Test Types Covered:	General/compatibility, interoperability, positive
Test report:	See Test Summary and Test Specification Tabs

General Feedback:

<Please list any general comments you want convey to Belkin>

Item #	Remarks / Notes
1	Sample 8 has dim LED's.
2	Sample 5 On Discharge, LED #1 does not Flash.

ISSUE summary table:

<Please list issues identified during this testing cycle>

Severity	ID	Title	Blocking Issue?	Occurrence rate	Assigned to(id)
			1		

Test Configuration:

<The table below includes all Operating Systems, browsers and their versions, and language packs which were tested>

Test Configuration	Operating System Type	Operating System Version	Operating System Service Pack	Browser Type	Browser Version	OS Language	Software Language
1							
2							
3							

Test Case	Parameter	Sample #	Expected Result	Observation	QA Comments/Issues
1	USB Cable	1	Ships with Belkin 6" Micro USB cable		Insertion/Extraction forces appear normal
		2			
		3			
		4			
2	Output USB ports	1	There should be a USB A port from which the Battery can be discharged. It should have a secure connection with any USB cable	USB and Micro USB connectors are easy to plug/unplug	All ports provide adequate security in connections
		2			
		3			
		4			
3	Input Power Port	1	There should be a MicroUSB B port from which the battery can be charged. It should have a secure connection with the connected cable		
		2			
		3			
		4			
4	Switch	1	1.Switch rocker does not bent or is not loose after use. 2.When switch is turned On, LED glows for activating the green LED brightly glows for indication charge remaining.	EVT samples on PCB board. Switch operation normal on all samples	Switch operation is normal
		2			
		3			
		4			
5	LEDs	1	Mode indication - Green LED on : Stand-by, Full-charge state - Charging state : Blinking green LED indicates that the battery is charging. Remaining capacity indicated as follows: 4 LEDs On : 75~ 100% - 3 LEDs On : 50~ 75% - 2 LEDs On : 25~ 50% - 1 LED On : 10~25% - 1 LED Blinking : 0~ 10%	Normal	LED function normal
		2		Normal	
		3		Normal	
		4		Normal	
6	Silk Screen Label	1	Should comply with Artwork	Artwork and Silk Screen Unavailable	Artwork and Silk Screen Unavailable
		2			
		3			
		4			
7	Input Current with all compatible supplies	1	1A to 2.4A	Normal	Max current drawn with 2.4 A charger is 1.9A.
		2		Normal	
		3		Normal	
		4		Normal	
8	Input Voltage with all compatible supplies	1	5±0.25 V	5.06V	Okay
		2		5.10v	
		3		5.04V	
		4		5.07V	
9	Output current	1	Max rated current output 2.4A Shared	2.4	Complies with the maximum 2.4 A current pull.
		2		2.4	
		3		2.4	
		4		2.4	
		1		5.09	
		2		5.03	
		3		5.02	

10	Output Voltage	4	Output Voltage at maximum discharge current of 2.4 A should be 5 ± 0.25 V	5.03	Output Voltage within range
11	Short circuit Response	1	After short circuit, it should function normally.	Normal	Short circuit indicated by one blinking LED. Button must be pressed to reset.
		2		Normal	
		3		Normal	
		4		Normal	
12	OCP	1	OCP limit is 2.9A	2.725	Pass
		2		2.676	
		3		2.645	
		4		2.742	
13	Device functionality after connection	1	There should not be any error in cellphone display or functionality after connection.	See the Compatibility tab	
		2			
		3			
		4			
14	Recharge and discharge times	1	Charging and Discharging times should be as per specs	Check Charge Profile	Pass
		2		Check Charge Profile	
		3		Check Charge Profile	
		4		Check Charge Profile	
15	Compatibility	1	Not Specified in specs.	See the Compatibility tab	
		2			
		3			
		4			
16	Ripple/Noise	1	Max 150mVpp with 20Mhz Band Width	~112mV p-p	Ripple/noise okay
		2			
		3			
		4			

Time (s)	Status	Source	Lingo	Command	Trans. ID	Description
369508.269000		ATS Lightning Box	--	--	--	<accessory disconnected>
369508.269000		ATS Lightning Box	--	--	--	<Apple device disconnected>
369512.636995		ATS Lightning Box	--	--	--	<accessory connected>
369517.141409	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369517.141409		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369517.383976		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.14 V>
369517.383976		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.78 V>
369517.383976		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.74 V>
369517.383976		Vbus Load Test	--	--	--	<USB Vbus load test finished>
369521.136803	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369521.136803		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369521.296285		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.19 V>
369521.296285		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.71 V>
369521.296285		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.77 V>
369521.297784		Vbus Load Test	--	--	--	<USB Vbus load test finished>
369523.519000	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369523.519000		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369523.712488		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.14 V>
369523.712488		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.67 V>
369523.712488		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.77 V>
369523.713987		Vbus Load Test	--	--	--	<USB Vbus load test finished>
369526.269000	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369526.269000		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369526.624232		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.12 V>
369526.624232		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.80 V>
369526.624232		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.76 V>
369526.624728		Vbus Load Test	--	--	--	<USB Vbus load test finished>
369528.769000	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369528.769000		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369528.975928		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.19 V>
369528.975928		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.70 V>
369528.975928		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.71 V>
369528.976424		Vbus Load Test	--	--	--	<USB Vbus load test finished>
369530.519000	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369530.519000		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369530.880088		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.18 V>
369530.880088		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.80 V>
369530.880088		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.76 V>
369530.880584		Vbus Load Test	--	--	--	<USB Vbus load test finished>
369533.269000	✓	Vbus Load Test	--	--	--	<USB Vbus load test began>
369533.269000		Vbus Load Test	--	--	--	<executing 2.4 A load test>
369533.496301		Vbus Load Test	--	--	--	<initial USB Vbus voltage: 5.18 V>
369533.496301		Vbus Load Test	--	--	--	<average USB Vbus voltage: 4.81 V>
369533.496301		Vbus Load Test	--	--	--	<final USB Vbus voltage: 4.77 V>
369533.496803		Vbus Load Test	--	--	--	<USB Vbus load test finished>

Electrical

Power to Accessory

Voltage 0.00 V

Current 0 mA

Power 0.0 W

Power to Apple device

Voltage 5.08 V

Current 0 mA

Power 0.0 W

USB Power Brick Detection

USB Vbus 5.11 V

USB D+ (220kΩ shunt to ground) 2.32 V

USB D+ (220kΩ shunt to vcc) 2.73 V

USB D- (220kΩ shunt to ground) 2.31 V

USB D- (220kΩ shunt to vcc) 2.72 V

Brick Detect: 2.4 A USB power brick

Lightning Module

Functional Variant B - USB Device Mode

Serial Transport

Nominal baud rate --

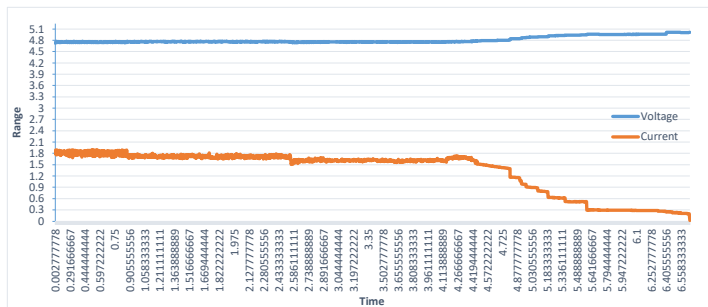
Max baud rate error (FF) --

Max baud rate error (55) --

Title	Note 2014		DCV_(020)	
Type	DCA_(181)			
MAX	1.899 A	12:46:22	4.9642 V	18:34:48
MIN	0.256 A	18:39:32	4.7314 V	12:18 58
AVG.	1.386 A		4.8047 V	

No	Date	Time	Value	Unit	Value	Unit
1	2017/04/11	12:15:42	1.825	A	4.7316	V
2	2017/04/11	12:15:52	1.791	A	4.7392	V
3	2017/04/11	12:16:02	1.841	A	4.759	V
4	2017/04/11	12:16:12	1.744	A	4.7584	V
5	2017/04/11	12:16:22	1.692	A	4.7575	V
6	2017/04/11	12:16:32	1.721	A	4.7418	V
7	2017/04/11	12:16:42	1.846	A	4.7436	V
8	2017/04/11	12:16:52	1.854	A	4.7387	V
9	2017/04/11	12:17:02	1.864	A	4.7686	V
10	2017/04/11	12:17:12	1.724	A	4.758	V
11	2017/04/11	12:17:22	1.699	A	4.7609	V
12	2017/04/11	12:17:32	1.705	A	4.7618	V
13	2017/04/11	12:17:42	1.653	A	4.7388	V
14	2017/04/11	12:17:52	1.855	A	4.7412	V
15	2017/04/11	12:18:02	1.862	A	4.7414	V
16	2017/04/11	12:18:12	1.876	A	4.7568	V
17	2017/04/11	12:18:22	1.747	A	4.7684	V
18	2017/04/11	12:18:32	1.696	A	4.7321	V
19	2017/04/11	12:18:42	1.845	A	4.7441	V
20	2017/04/11	12:18:52	1.872	A	4.7334	V
21	2017/04/11	12:19:02	1.86	A	4.7314	V
22	2017/04/11	12:19:12	1.756	A	4.7344	V
23	2017/04/11	12:19:22	1.736	A	4.7602	V
24	2017/04/11	12:19:32	1.787	A	4.7567	V
25	2017/04/11	12:19:42	1.835	A	4.7741	V
26	2017/04/11	12:19:52	1.809	A	4.7587	V
27	2017/04/11	12:20:02	1.778	A	4.7369	V
28	2017/04/11	12:20:12	1.795	A	4.7472	V
29	2017/04/11	12:20:22	1.819	A	4.7457	V
30	2017/04/11	12:20:32	1.857	A	4.7658	V
31	2017/04/11	12:20:42	1.769	A	4.7654	V
32	2017/04/11	12:20:52	1.784	A	4.7578	V
33	2017/04/11	12:21:02	1.86	A	4.7631	V
34	2017/04/11	12:21:12	1.882	A	4.7375	V
35	2017/04/11	12:21:22	1.874	A	4.7355	V
36	2017/04/11	12:21:32	1.875	A	4.7337	V
37	2017/04/11	12:21:42	1.745	A	4.7707	V
38	2017/04/11	12:21:52	1.755	A	4.7603	V
39	2017/04/11	12:22:02	1.71	A	4.7477	V
40	2017/04/11	12:22:12	1.882	A	4.759	V
41	2017/04/11	12:22:22	1.892	A	4.7508	V
42	2017/04/11	12:22:32	1.883	A	4.7484	V
43	2017/04/11	12:22:42	1.848	A	4.7427	V
44	2017/04/11	12:22:52	1.836	A	4.7646	V
45	2017/04/11	12:23:02	1.85	A	4.7632	V
46	2017/04/11	12:23:12	1.808	A	4.7593	V
47	2017/04/11	12:23:22	1.81	A	4.7688	V
48	2017/04/11	12:23:32	1.792	A	4.7417	V
49	2017/04/11	12:23:42	1.887	A	4.7386	V
50	2017/04/11	12:23:52	1.89	A	4.7417	V
51	2017/04/11	12:24:02	1.89	A	4.7401	V
52	2017/04/11	12:24:12	1.774	A	4.7692	V
53	2017/04/11	12:24:22	1.783	A	4.7658	V
54	2017/04/11	12:24:32	1.763	A	4.7719	V
55	2017/04/11	12:24:42	1.759	A	4.7494	V
56	2017/04/11	12:24:52	1.889	A	4.7413	V
57	2017/04/11	12:25:02	1.89	A	4.7445	V
58	2017/04/11	12:25:12	1.773	A	4.7532	V
59	2017/04/11	12:25:22	1.77	A	4.7576	V
60	2017/04/11	12:25:32	1.817	A	4.7672	V
61	2017/04/11	12:25:42	1.828	A	4.7668	V
62	2017/04/11	12:25:52	1.828	A	4.7632	V
63	2017/04/11	12:26:02	1.767	A	4.744	V
64	2017/04/11	12:26:12	1.874	A	4.7464	V
65	2017/04/11	12:26:22	1.864	A	4.7448	V
66	2017/04/11	12:26:32	1.877	A	4.7495	V
67	2017/04/11	12:26:42	1.874	A	4.7615	V
68	2017/04/11	12:26:52	1.769	A	4.7419	V
69	2017/04/11	12:27:02	1.746	A	4.7456	V
70	2017/04/11	12:27:12	1.862	A	4.7484	V
71	2017/04/11	12:27:22	1.874	A	4.7453	V
72	2017/04/11	12:27:32	1.872	A	4.7483	V
73	2017/04/11	12:27:42	1.761	A	4.7466	V
74	2017/04/11	12:27:52	1.778	A	4.766	V
75	2017/04/11	12:28:02	1.78	A	4.7603	V
76	2017/04/11	12:28:12	1.835	A	4.7598	V
77	2017/04/11	12:28:22	1.792	A	4.7572	V
78	2017/04/11	12:28:32	1.836	A	4.7484	V
79	2017/04/11	12:28:42	1.85	A	4.7492	V
80	2017/04/11	12:28:52	1.863	A	4.7488	V
81	2017/04/11	12:29:02	1.861	A	4.7557	V
82	2017/04/11	12:29:12	1.862	A	4.7496	V
83	2017/04/11	12:29:22	1.794	A	4.7493	V
84	2017/04/11	12:29:32	1.78	A	4.7518	V
85	2017/04/11	12:29:42	1.858	A	4.7504	V
86	2017/04/11	12:29:52	1.852	A	4.7479	V
87	2017/04/11	12:30:02	1.771	A	4.7506	V

Time
0.0027778 1st Green Light (Top) Starts Flashing.
0.0055556
0.0083333
0.0111111
0.0138889
0.0166667
0.0194444
0.0222222
0.025
0.0277778
0.0305556
0.0333333
0.0361111
0.0388889
0.0416667
0.0444444
0.0472222



Time to completely Charge battery @ 2.4 A/h is 6 Hours 38 Minutes 20 Seconds.

1st Green Light Turns Solid & 2nd Green Light Starts Flashing at 13:08:52.
Total Time to do this: 53 Minutes 10 Seconds.

2nd Green Light Turns Solid & 3rd Green Light Starts Flashing at 15:15:32.
Time From 1st Solid Green Light to do this: 2 Hours 6 Minutes 40 Seconds.
Total Time to Do this: 2 Hours 59 Minutes 50 Seconds.

3rd Green Light Turns Solid & 4th Green Light Starts Flashing at 16:48:02.
Time From 2nd Solid Green Light to do this: 1 Hour 32 Minutes 30 Seconds.
Total Time to Do this: 4 Hours 32 Minutes 20 Seconds.

4th Green Light Turns Solid at 18:45:02.
Time From 3rd Solid Green Light to do this: 1 Hour 57 Minutes 0 Seconds.
Total Time to Do this: 6 Hours 19 Minutes 20 Seconds.

88	2017/04/11	12:30:12	1.789	A	4.7493	V	0.244444
89	2017/04/11	12:30:22	1.751	A	4.7665	V	0.247222
90	2017/04/11	12:30:32	1.778	A	4.7667	V	0.25
91	2017/04/11	12:30:42	1.805	A	4.7694	V	0.252778
92	2017/04/11	12:30:52	1.84	A	4.773	V	0.255556
93	2017/04/11	12:31:02	1.802	A	4.7502	V	0.258333
94	2017/04/11	12:31:12	1.872	A	4.7404	V	0.261111
95	2017/04/11	12:31:22	1.875	A	4.7447	V	0.263889
96	2017/04/11	12:31:32	1.873	A	4.7475	V	0.266667
97	2017/04/11	12:31:42	1.781	A	4.7644	V	0.269444
98	2017/04/11	12:31:52	1.723	A	4.7644	V	0.272222
99	2017/04/11	12:32:02	1.75	A	4.7651	V	0.275
100	2017/04/11	12:32:12	1.882	A	4.748	V	0.277778
101	2017/04/11	12:32:22	1.875	A	4.7429	V	0.280556
102	2017/04/11	12:32:32	1.886	A	4.7432	V	0.283333
103	2017/04/11	12:32:42	1.706	A	4.738	V	0.286111
104	2017/04/11	12:32:52	1.758	A	4.766	V	0.288889
105	2017/04/11	12:33:02	1.799	A	4.7672	V	0.291667
106	2017/04/11	12:33:12	1.822	A	4.7652	V	0.294444
107	2017/04/11	12:33:22	1.82	A	4.7583	V	0.297222
108	2017/04/11	12:33:32	1.727	A	4.7413	V	0.3
109	2017/04/11	12:33:42	1.868	A	4.7451	V	0.302778
110	2017/04/11	12:33:52	1.891	A	4.7423	V	0.305556
111	2017/04/11	12:34:02	1.89	A	4.742	V	0.308333
112	2017/04/11	12:34:12	1.752	A	4.7639	V	0.311111
113	2017/04/11	12:34:22	1.766	A	4.7559	V	0.313889
114	2017/04/11	12:34:32	1.686	A	4.7596	V	0.316667
115	2017/04/11	12:34:42	1.887	A	4.7457	V	0.319444
116	2017/04/11	12:34:52	1.887	A	4.7417	V	0.322222
117	2017/04/11	12:35:02	1.887	A	4.7421	V	0.325
118	2017/04/11	12:35:12	1.789	A	4.7416	V	0.327778
119	2017/04/11	12:35:22	1.75	A	4.7726	V	0.330556
120	2017/04/11	12:35:32	1.778	A	4.7699	V	0.333333
121	2017/04/11	12:35:42	1.815	A	4.764	V	0.336111
122	2017/04/11	12:35:52	1.866	A	4.7539	V	0.338889
123	2017/04/11	12:36:02	1.795	A	4.7425	V	0.341667
124	2017/04/11	12:36:12	1.88	A	4.7428	V	0.344444
125	2017/04/11	12:36:22	1.878	A	4.7431	V	0.347222
126	2017/04/11	12:36:32	1.755	A	4.7434	V	0.35
127	2017/04/11	12:36:42	1.758	A	4.7647	V	0.352778
128	2017/04/11	12:36:52	1.773	A	4.7659	V	0.355556
129	2017/04/11	12:37:02	1.743	A	4.763	V	0.358333
130	2017/04/11	12:37:12	1.753	A	4.7465	V	0.361111
131	2017/04/11	12:37:22	1.872	A	4.7708	V	0.363889
132	2017/04/11	12:37:32	1.873	A	4.7446	V	0.366667
133	2017/04/11	12:37:42	1.748	A	4.7447	V	0.369444
134	2017/04/11	12:37:52	1.764	A	4.7612	V	0.372222
135	2017/04/11	12:38:02	1.777	A	4.7682	V	0.375
136	2017/04/11	12:38:12	1.819	A	4.7449	V	0.377778
137	2017/04/11	12:38:22	1.771	A	4.7711	V	0.380556
138	2017/04/11	12:38:32	1.826	A	4.7446	V	0.383333
139	2017/04/11	12:38:42	1.864	A	4.7451	V	0.386111
140	2017/04/11	12:38:52	1.863	A	4.7451	V	0.388889
141	2017/04/11	12:39:02	1.862	A	4.7513	V	0.391667
142	2017/04/11	12:39:12	1.862	A	4.7614	V	0.394444
143	2017/04/11	12:39:22	1.754	A	4.7685	V	0.397222
144	2017/04/11	12:39:32	1.861	A	4.7455	V	0.4
145	2017/04/11	12:39:42	1.859	A	4.7526	V	0.402778
146	2017/04/11	12:39:52	1.858	A	4.7458	V	0.405556
147	2017/04/11	12:40:02	1.858	A	4.7464	V	0.408333
148	2017/04/11	12:40:12	1.701	A	4.746	V	0.411111
149	2017/04/11	12:40:22	1.744	A	4.7666	V	0.413889
150	2017/04/11	12:40:32	1.819	A	4.7659	V	0.416667
151	2017/04/11	12:40:42	1.791	A	4.7743	V	0.419444
152	2017/04/11	12:40:52	1.809	A	4.7583	V	0.422222
153	2017/04/11	12:41:02	1.749	A	4.7696	V	0.425
154	2017/04/11	12:41:12	1.85	A	4.7464	V	0.427778
155	2017/04/11	12:41:22	1.857	A	4.7475	V	0.430556
156	2017/04/11	12:41:32	1.853	A	4.7496	V	0.433333
157	2017/04/11	12:41:42	1.861	A	4.7595	V	0.436111
158	2017/04/11	12:41:52	1.75	A	4.7456	V	0.438889
159	2017/04/11	12:42:02	1.753	A	4.7448	V	0.441667
160	2017/04/11	12:42:12	1.73	A	4.7659	V	0.444444
161	2017/04/11	12:42:22	1.868	A	4.7467	V	0.447222
162	2017/04/11	12:42:32	1.873	A	4.7477	V	0.45
163	2017/04/11	12:42:42	1.869	A	4.742	V	0.452778
164	2017/04/11	12:42:52	1.745	A	4.761	V	0.455556
165	2017/04/11	12:43:02	1.822	A	4.763	V	0.458333
166	2017/04/11	12:43:12	1.82	A	4.7433	V	0.461111
167	2017/04/11	12:43:22	1.783	A	4.7547	V	0.463889
168	2017/04/11	12:43:32	1.738	A	4.7416	V	0.466667
169	2017/04/11	12:43:42	1.875	A	4.7409	V	0.469444
170	2017/04/11	12:43:52	1.875	A	4.741	V	0.472222
171	2017/04/11	12:44:02	1.877	A	4.7474	V	0.475
172	2017/04/11	12:44:12	1.88	A	4.7653	V	0.477778
173	2017/04/11	12:44:22	1.77	A	4.7675	V	0.480556
174	2017/04/11	12:44:32	1.747	A	4.7628	V	0.483333
175	2017/04/11	12:44:42	1.753	A	4.7646	V	0.486111
176	2017/04/11	12:44:52	1.878	A	4.768	V	0.488889
177	2017/04/11	12:45:02	1.763	A	4.7585	V	0.491667
178	2017/04/11	12:45:12	1.771	A	4.7432	V	0.494444
179	2017/04/11	12:45:22	1.816	A	4.7607	V	0.497222
180	2017/04/11	12:45:32	1.817	A	4.7536	V	0.5
181	2017/04/11	12:45:42	1.787	A	4.7647	V	0.502778

182	2017/04/11	12:45:52	1.782	A	4.7589	V	0.505556
183	2017/04/11	12:46:02	1.757	A	4.7441	V	0.508333
184	2017/04/11	12:46:12	1.746	A	4.768	V	0.511111
185	2017/04/11	12:46:22	1.899	A	4.7435	V	0.513889
186	2017/04/11	12:46:32	1.754	A	4.7434	V	0.516667
187	2017/04/11	12:46:42	1.751	A	4.7632	V	0.519444
188	2017/04/11	12:46:52	1.718	A	4.7703	V	0.522222
189	2017/04/11	12:47:02	1.763	A	4.7633	V	0.525
190	2017/04/11	12:47:12	1.893	A	4.7597	V	0.527778
191	2017/04/11	12:47:22	1.889	A	4.7437	V	0.530556
192	2017/04/11	12:47:32	1.885	A	4.743	V	0.533333
193	2017/04/11	12:47:42	1.732	A	4.7428	V	0.536111
194	2017/04/11	12:47:52	1.785	A	4.7533	V	0.538889
195	2017/04/11	12:48:02	1.856	A	4.7641	V	0.541667
196	2017/04/11	12:48:12	1.879	A	4.7423	V	0.544444
197	2017/04/11	12:48:22	1.721	A	4.7421	V	0.547222
198	2017/04/11	12:48:32	1.78	A	4.7694	V	0.55
199	2017/04/11	12:48:42	1.742	A	4.7581	V	0.552778
200	2017/04/11	12:48:52	1.887	A	4.7428	V	0.555556
201	2017/04/11	12:49:02	1.887	A	4.7422	V	0.558333
202	2017/04/11	12:49:12	1.887	A	4.7547	V	0.561111
203	2017/04/11	12:49:22	1.793	A	4.7619	V	0.563889
204	2017/04/11	12:49:32	1.742	A	4.7429	V	0.566667
205	2017/04/11	12:49:42	1.885	A	4.7578	V	0.569444
206	2017/04/11	12:49:52	1.885	A	4.7433	V	0.572222
207	2017/04/11	12:50:02	1.87	A	4.7434	V	0.575
208	2017/04/11	12:50:12	1.809	A	4.7431	V	0.577778
209	2017/04/11	12:50:22	1.814	A	4.7447	V	0.580556
210	2017/04/11	12:50:32	1.856	A	4.7434	V	0.583333
211	2017/04/11	12:50:42	1.873	A	4.7417	V	0.586111
212	2017/04/11	12:50:52	1.749	A	4.7421	V	0.588889
213	2017/04/11	12:51:02	1.719	A	4.7605	V	0.591667
214	2017/04/11	12:51:12	1.712	A	4.7611	V	0.594444
215	2017/04/11	12:51:22	1.759	A	4.7615	V	0.597222
216	2017/04/11	12:51:32	1.759	A	4.7428	V	0.6
217	2017/04/11	12:51:42	1.767	A	4.7574	V	0.602778
218	2017/04/11	12:51:52	1.723	A	4.7692	V	0.605556
219	2017/04/11	12:52:02	1.874	A	4.7637	V	0.608333
220	2017/04/11	12:52:12	1.873	A	4.762	V	0.611111
221	2017/04/11	12:52:22	1.86	A	4.7435	V	0.613889
222	2017/04/11	12:52:32	1.844	A	4.7436	V	0.616667
223	2017/04/11	12:52:42	1.77	A	4.7439	V	0.619444
224	2017/04/11	12:52:52	1.816	A	4.7441	V	0.622222
225	2017/04/11	12:53:02	1.844	A	4.7443	V	0.625
226	2017/04/11	12:53:12	1.872	A	4.7444	V	0.627778
227	2017/04/11	12:53:22	1.724	A	4.7444	V	0.630556
228	2017/04/11	12:53:32	1.87	A	4.7579	V	0.633333
229	2017/04/11	12:53:42	1.87	A	4.7447	V	0.636111
230	2017/04/11	12:53:52	1.869	A	4.745	V	0.638889
231	2017/04/11	12:54:02	1.867	A	4.7682	V	0.641667
232	2017/04/11	12:54:12	1.739	A	4.7451	V	0.644444
233	2017/04/11	12:54:22	1.776	A	4.7637	V	0.647222
234	2017/04/11	12:54:32	1.734	A	4.7571	V	0.65
235	2017/04/11	12:54:42	1.731	A	4.7687	V	0.652778
236	2017/04/11	12:54:52	1.831	A	4.7507	V	0.655556
237	2017/04/11	12:55:02	1.765	A	4.7456	V	0.658333
238	2017/04/11	12:55:12	1.739	A	4.7581	V	0.661111
239	2017/04/11	12:55:22	1.85	A	4.7587	V	0.663889
240	2017/04/11	12:55:32	1.862	A	4.746	V	0.666667
241	2017/04/11	12:55:42	1.863	A	4.7457	V	0.669444
242	2017/04/11	12:55:52	1.774	A	4.7588	V	0.672222
243	2017/04/11	12:56:02	1.722	A	4.7617	V	0.675
244	2017/04/11	12:56:12	1.861	A	4.7461	V	0.677778
245	2017/04/11	12:56:22	1.862	A	4.7463	V	0.680556
246	2017/04/11	12:56:32	1.862	A	4.7464	V	0.683333
247	2017/04/11	12:56:42	1.86	A	4.7511	V	0.686111
248	2017/04/11	12:56:52	1.774	A	4.7467	V	0.688889
249	2017/04/11	12:57:02	1.857	A	4.7473	V	0.691667
250	2017/04/11	12:57:12	1.827	A	4.7677	V	0.694444
251	2017/04/11	12:57:22	1.798	A	4.7603	V	0.697222
252	2017/04/11	12:57:32	1.773	A	4.7464	V	0.7
253	2017/04/11	12:57:42	1.758	A	4.7464	V	0.702778
254	2017/04/11	12:57:52	1.862	A	4.7603	V	0.705556
255	2017/04/11	12:58:02	1.86	A	4.7458	V	0.708333
256	2017/04/11	12:58:12	1.751	A	4.7649	V	0.711111
257	2017/04/11	12:58:22	1.697	A	4.7557	V	0.713889
258	2017/04/11	12:58:32	1.758	A	4.7674	V	0.716667
259	2017/04/11	12:58:42	1.693	A	4.7509	V	0.719444
260	2017/04/11	12:58:52	1.858	A	4.7435	V	0.722222
261	2017/04/11	12:59:02	1.86	A	4.7441	V	0.725
262	2017/04/11	12:59:12	1.849	A	4.7494	V	0.727778
263	2017/04/11	12:59:22	1.8	A	4.745	V	0.730556
264	2017/04/11	12:59:32	1.777	A	4.764	V	0.733333
265	2017/04/11	12:59:42	1.838	A	4.7608	V	0.736111
266	2017/04/11	12:59:52	1.79	A	4.7626	V	0.738889
267	2017/04/11	13:00:02	1.696	A	4.7428	V	0.741667
268	2017/04/11	13:00:12	1.744	A	4.762	V	0.744444
269	2017/04/11	13:00:22	1.86	A	4.7604	V	0.747222
270	2017/04/11	13:00:32	1.865	A	4.7503	V	0.75
271	2017/04/11	13:00:42	1.719	A	4.7582	V	0.752778
272	2017/04/11	13:00:52	1.725	A	4.7737	V	0.755556
273	2017/04/11	13:01:02	1.768	A	4.7447	V	0.758333
274	2017/04/11	13:01:12	1.727	A	4.7639	V	0.761111
275	2017/04/11	13:01:22	1.866	A	4.7586	V	0.763889

276	2017/04/11	13 01:32	1.871 A	4.7546 V	0.766667
277	2017/04/11	13 01:42	1.844 A	4.7666 V	0.769444
278	2017/04/11	13 01:52	1.823 A	4.7489 V	0.772222
279	2017/04/11	13 02:02	1.867 A	4.7559 V	0.775
280	2017/04/11	13 02:12	1.879 A	4.7629 V	0.777778
281	2017/04/11	13 02:22	1.776 A	4.7658 V	0.780556
282	2017/04/11	13 02:32	1.768 A	4.7548 V	0.783333
283	2017/04/11	13 02:42	1.871 A	4.7618 V	0.786111
284	2017/04/11	13 02:52	1.867 A	4.7456 V	0.788889
285	2017/04/11	13 03:02	1.881 A	4.7434 V	0.791667
286	2017/04/11	13 03:12	1.879 A	4.7609 V	0.794444
287	2017/04/11	13 03:22	1.727 A	4.7662 V	0.797222
288	2017/04/11	13 03:32	1.75 A	4.7698 V	0.8
289	2017/04/11	13 03:42	1.763 A	4.7692 V	0.802778
290	2017/04/11	13 03:52	1.858 A	4.745 V	0.805556
291	2017/04/11	13 04:02	1.826 A	4.7421 V	0.808333
292	2017/04/11	13 04:12	1.778 A	4.7452 V	0.811111
293	2017/04/11	13 04:22	1.806 A	4.7521 V	0.813889
294	2017/04/11	13 04:32	1.869 A	4.7431 V	0.816667
295	2017/04/11	13 04:42	1.879 A	4.7418 V	0.819444
296	2017/04/11	13 04:52	1.87 A	4.7419 V	0.822222
297	2017/04/11	13 05:02	1.719 A	4.7624 V	0.825
298	2017/04/11	13 05:12	1.885 A	4.7424 V	0.827778
299	2017/04/11	13 05:22	1.878 A	4.7415 V	0.830556
300	2017/04/11	13 05:32	1.883 A	4.7431 V	0.833333
301	2017/04/11	13 05:42	1.878 A	4.7464 V	0.836111
302	2017/04/11	13 05:52	1.793 A	4.7594 V	0.838889
303	2017/04/11	13 06:02	1.717 A	4.7587 V	0.841667
304	2017/04/11	13 06:12	1.841 A	4.7431 V	0.844444
305	2017/04/11	13 06:22	1.805 A	4.7629 V	0.847222
306	2017/04/11	13 06:32	1.773 A	4.7411 V	0.85
307	2017/04/11	13 06:42	1.867 A	4.7432 V	0.852778
308	2017/04/11	13 06:52	1.882 A	4.7401 V	0.855556
309	2017/04/11	13 07:02	1.88 A	4.7512 V	0.858333
310	2017/04/11	13 07:12	1.734 A	4.762 V	0.861111
311	2017/04/11	13 07:22	1.743 A	4.7615 V	0.863889
312	2017/04/11	13 07:32	1.715 A	4.764 V	0.866667
313	2017/04/11	13 07:42	1.764 A	4.7662 V	0.869444
314	2017/04/11	13 07:52	1.885 A	4.758 V	0.872222
315	2017/04/11	13 08:02	1.891 A	4.7432 V	0.875
316	2017/04/11	13 08:12	1.724 A	4.7404 V	0.877778
317	2017/04/11	13 08:22	1.707 A	4.775 V	0.880556
318	2017/04/11	13 08:32	1.704 A	4.7714 V	0.883333
319	2017/04/11	13 08:42	1.697 A	4.7646 V	0.886111
320	2017/04/11	13 08:52	1.693 A	4.7613 V	0.888889
321	2017/04/11	13 09:02	1.721 A	4.7629 V	0.891667
322	2017/04/11	13 09:12	1.681 A	4.7625 V	0.894444
323	2017/04/11	13 09:22	1.665 A	4.7688 V	0.897222
324	2017/04/11	13 09:32	1.763 A	4.7687 V	0.9
325	2017/04/11	13 09:42	1.69 A	4.7566 V	0.902778
326	2017/04/11	13 09:52	1.704 A	4.7652 V	0.905556
327	2017/04/11	13 10:02	1.69 A	4.7661 V	0.908333
328	2017/04/11	13 10:12	1.712 A	4.7642 V	0.911111
329	2017/04/11	13 10:22	1.757 A	4.7638 V	0.913889
330	2017/04/11	13 10:32	1.725 A	4.7568 V	0.916667
331	2017/04/11	13 10:42	1.754 A	4.7644 V	0.919444
332	2017/04/11	13 10:52	1.717 A	4.7544 V	0.922222
333	2017/04/11	13 11:02	1.726 A	4.7592 V	0.925
334	2017/04/11	13 11:12	1.663 A	4.7612 V	0.927778
335	2017/04/11	13 11:22	1.699 A	4.7708 V	0.930556
336	2017/04/11	13 11:32	1.685 A	4.7585 V	0.933333
337	2017/04/11	13 11:42	1.769 A	4.7615 V	0.936111
338	2017/04/11	13 11:52	1.748 A	4.7596 V	0.938889
339	2017/04/11	13 12:02	1.752 A	4.7556 V	0.941667
340	2017/04/11	13 12:12	1.753 A	4.7651 V	0.944444
341	2017/04/11	13 12:22	1.741 A	4.7545 V	0.947222
342	2017/04/11	13 12:32	1.675 A	4.7627 V	0.95
343	2017/04/11	13 12:42	1.769 A	4.7745 V	0.952778
344	2017/04/11	13 12:52	1.735 A	4.7692 V	0.955556
345	2017/04/11	13 13:02	1.73 A	4.7507 V	0.958333
346	2017/04/11	13 13:12	1.728 A	4.7604 V	0.961111
347	2017/04/11	13 13:22	1.723 A	4.7681 V	0.963889
348	2017/04/11	13 13:32	1.76 A	4.7671 V	0.966667
349	2017/04/11	13 13:42	1.741 A	4.7667 V	0.969444
350	2017/04/11	13 13:52	1.755 A	4.7649 V	0.972222
351	2017/04/11	13 14:02	1.712 A	4.7632 V	0.975
352	2017/04/11	13 14:12	1.757 A	4.767 V	0.977778
353	2017/04/11	13 14:22	1.759 A	4.7608 V	0.980556
354	2017/04/11	13 14:32	1.789 A	4.7541 V	0.983333
355	2017/04/11	13 14:42	1.704 A	4.7645 V	0.986111
356	2017/04/11	13 14:52	1.693 A	4.7635 V	0.988889
357	2017/04/11	13 15:02	1.693 A	4.7684 V	0.991667
358	2017/04/11	13 15:12	1.76 A	4.7651 V	0.994444
359	2017/04/11	13 15:22	1.732 A	4.7711 V	0.997222
360	2017/04/11	13 15:32	1.722 A	4.7545 V	1
361	2017/04/11	13 15:42	1.707 A	4.7631 V	1.002778
362	2017/04/11	13 15:52	1.743 A	4.7627 V	1.005556
363	2017/04/11	13 16:02	1.748 A	4.7626 V	1.008333
364	2017/04/11	13 16:12	1.76 A	4.7642 V	1.011111
365	2017/04/11	13 16:22	1.717 A	4.7709 V	1.013889
366	2017/04/11	13 16:32	1.696 A	4.7654 V	1.016667
367	2017/04/11	13 16:42	1.697 A	4.7702 V	1.019444
368	2017/04/11	13 16:52	1.697 A	4.7683 V	1.022222
369	2017/04/11	13 17:02	1.736 A	4.7724 V	1.025

1st green Light on, 2nd Green Light Flashing.

370	2017/04/11	13:17:12	1.692	A	4.7593	V	1.027778
371	2017/04/11	13:17:22	1.717	A	4.7639	V	1.030556
372	2017/04/11	13:17:32	1.7	A	4.767	V	1.033333
373	2017/04/11	13:17:42	1.747	A	4.768	V	1.036111
374	2017/04/11	13:17:52	1.704	A	4.7689	V	1.038889
375	2017/04/11	13:18:02	1.695	A	4.7643	V	1.041667
376	2017/04/11	13:18:12	1.707	A	4.7697	V	1.044444
377	2017/04/11	13:18:22	1.711	A	4.7578	V	1.047222
378	2017/04/11	13:18:32	1.731	A	4.7583	V	1.05
379	2017/04/11	13:18:42	1.706	A	4.7675	V	1.052778
380	2017/04/11	13:18:52	1.685	A	4.7693	V	1.055556
381	2017/04/11	13:19:02	1.709	A	4.7646	V	1.058333
382	2017/04/11	13:19:12	1.682	A	4.7548	V	1.061111
383	2017/04/11	13:19:22	1.77	A	4.7709	V	1.063889
384	2017/04/11	13:19:32	1.743	A	4.7672	V	1.066667
385	2017/04/11	13:19:42	1.738	A	4.7727	V	1.069444
386	2017/04/11	13:19:52	1.736	A	4.7603	V	1.072222
387	2017/04/11	13:20:02	1.745	A	4.765	V	1.075
388	2017/04/11	13:20:12	1.759	A	4.7566	V	1.077778
389	2017/04/11	13:20:22	1.732	A	4.7605	V	1.080556
390	2017/04/11	13:20:32	1.716	A	4.7692	V	1.083333
391	2017/04/11	13:20:42	1.703	A	4.7637	V	1.086111
392	2017/04/11	13:20:52	1.734	A	4.761	V	1.088889
393	2017/04/11	13:21:02	1.715	A	4.7707	V	1.091667
394	2017/04/11	13:21:12	1.719	A	4.7604	V	1.094444
395	2017/04/11	13:21:22	1.696	A	4.7594	V	1.097222
396	2017/04/11	13:21:32	1.701	A	4.7679	V	1.1
397	2017/04/11	13:21:42	1.742	A	4.7665	V	1.102778
398	2017/04/11	13:21:52	1.756	A	4.7652	V	1.105556
399	2017/04/11	13:22:02	1.745	A	4.7676	V	1.108333
400	2017/04/11	13:22:12	1.715	A	4.7724	V	1.111111
401	2017/04/11	13:22:22	1.691	A	4.7704	V	1.113889
402	2017/04/11	13:22:32	1.738	A	4.7698	V	1.116667
403	2017/04/11	13:22:42	1.713	A	4.7679	V	1.119444
404	2017/04/11	13:22:52	1.704	A	4.7677	V	1.122222
405	2017/04/11	13:23:02	1.695	A	4.7731	V	1.125
406	2017/04/11	13:23:12	1.745	A	4.7609	V	1.127778
407	2017/04/11	13:23:22	1.785	A	4.7573	V	1.130556
408	2017/04/11	13:23:32	1.715	A	4.7629	V	1.133333
409	2017/04/11	13:23:42	1.766	A	4.7626	V	1.136111
410	2017/04/11	13:23:52	1.802	A	4.7534	V	1.138889
411	2017/04/11	13:24:02	1.729	A	4.7687	V	1.141667
412	2017/04/11	13:24:12	1.699	A	4.7694	V	1.144444
413	2017/04/11	13:24:22	1.729	A	4.7672	V	1.147222
414	2017/04/11	13:24:32	1.716	A	4.7683	V	1.15
415	2017/04/11	13:24:42	1.698	A	4.7709	V	1.152778
416	2017/04/11	13:24:52	1.766	A	4.7638	V	1.155556
417	2017/04/11	13:25:02	1.721	A	4.7674	V	1.158333
418	2017/04/11	13:25:12	1.767	A	4.7691	V	1.161111
419	2017/04/11	13:25:22	1.693	A	4.7667	V	1.163889
420	2017/04/11	13:25:32	1.701	A	4.7679	V	1.166667
421	2017/04/11	13:25:42	1.693	A	4.7669	V	1.169444
422	2017/04/11	13:25:52	1.715	A	4.7662	V	1.172222
423	2017/04/11	13:26:02	1.735	A	4.7665	V	1.175
424	2017/04/11	13:26:12	1.698	A	4.7656	V	1.177778
425	2017/04/11	13:26:22	1.699	A	4.7582	V	1.180556
426	2017/04/11	13:26:32	1.707	A	4.765	V	1.183333
427	2017/04/11	13:26:42	1.721	A	4.7722	V	1.186111
428	2017/04/11	13:26:52	1.668	A	4.7638	V	1.188889
429	2017/04/11	13:27:02	1.704	A	4.7651	V	1.191667
430	2017/04/11	13:27:12	1.697	A	4.7704	V	1.194444
431	2017/04/11	13:27:22	1.715	A	4.7672	V	1.197222
432	2017/04/11	13:27:32	1.731	A	4.7642	V	1.2
433	2017/04/11	13:27:42	1.711	A	4.7697	V	1.202778
434	2017/04/11	13:27:52	1.69	A	4.7683	V	1.205556
435	2017/04/11	13:28:02	1.691	A	4.7662	V	1.208333
436	2017/04/11	13:28:12	1.682	A	4.767	V	1.211111
437	2017/04/11	13:28:22	1.74	A	4.77	V	1.213889
438	2017/04/11	13:28:32	1.752	A	4.7671	V	1.216667
439	2017/04/11	13:28:42	1.742	A	4.7635	V	1.219444
440	2017/04/11	13:28:52	1.709	A	4.7686	V	1.222222
441	2017/04/11	13:29:02	1.738	A	4.7719	V	1.225
442	2017/04/11	13:29:12	1.726	A	4.7673	V	1.227778
443	2017/04/11	13:29:22	1.68	A	4.7646	V	1.230556
444	2017/04/11	13:29:32	1.677	A	4.7626	V	1.233333
445	2017/04/11	13:29:42	1.741	A	4.7692	V	1.236111
446	2017/04/11	13:29:52	1.738	A	4.7639	V	1.238889
447	2017/04/11	13:30:02	1.724	A	4.7685	V	1.241667
448	2017/04/11	13:30:12	1.77	A	4.7666	V	1.244444
449	2017/04/11	13:30:22	1.705	A	4.7721	V	1.247222
450	2017/04/11	13:30:32	1.677	A	4.7719	V	1.25
451	2017/04/11	13:30:42	1.685	A	4.7691	V	1.252778
452	2017/04/11	13:30:52	1.734	A	4.7644	V	1.255556
453	2017/04/11	13:31:02	1.679	A	4.7613	V	1.258333
454	2017/04/11	13:31:12	1.726	A	4.7656	V	1.261111
455	2017/04/11	13:31:22	1.701	A	4.76	V	1.263889
456	2017/04/11	13:31:32	1.725	A	4.7727	V	1.266667
457	2017/04/11	13:31:42	1.727	A	4.7686	V	1.269444
458	2017/04/11	13:31:52	1.683	A	4.7608	V	1.272222
459	2017/04/11	13:32:02	1.699	A	4.7632	V	1.275
460	2017/04/11	13:32:12	1.704	A	4.7687	V	1.277778
461	2017/04/11	13:32:22	1.72	A	4.77	V	1.280556
462	2017/04/11	13:32:32	1.728	A	4.7505	V	1.283333
463	2017/04/11	13:32:42	1.769	A	4.7615	V	1.286111

464	2017/04/11	13:32:52	1.699	A	4.7668	V	1.288889
465	2017/04/11	13:33:02	1.703	A	4.7649	V	1.291667
466	2017/04/11	13:33:12	1.705	A	4.7582	V	1.294444
467	2017/04/11	13:33:22	1.715	A	4.7681	V	1.297222
468	2017/04/11	13:33:32	1.685	A	4.766	V	1.3
469	2017/04/11	13:33:42	1.726	A	4.7646	V	1.302778
470	2017/04/11	13:33:52	1.72	A	4.7584	V	1.305556
471	2017/04/11	13:34:02	1.729	A	4.7591	V	1.308333
472	2017/04/11	13:34:12	1.743	A	4.7598	V	1.311111
473	2017/04/11	13:34:22	1.696	A	4.7591	V	1.313889
474	2017/04/11	13:34:32	1.681	A	4.7619	V	1.316667
475	2017/04/11	13:34:42	1.707	A	4.7647	V	1.319444
476	2017/04/11	13:34:52	1.698	A	4.7687	V	1.322222
477	2017/04/11	13:35:02	1.756	A	4.7624	V	1.325
478	2017/04/11	13:35:12	1.743	A	4.7646	V	1.327778
479	2017/04/11	13:35:22	1.695	A	4.7655	V	1.330556
480	2017/04/11	13:35:32	1.72	A	4.768	V	1.333333
481	2017/04/11	13:35:42	1.723	A	4.7614	V	1.336111
482	2017/04/11	13:35:52	1.753	A	4.773	V	1.338889
483	2017/04/11	13:36:02	1.672	A	4.7734	V	1.341667
484	2017/04/11	13:36:12	1.758	A	4.7671	V	1.344444
485	2017/04/11	13:36:22	1.737	A	4.7637	V	1.347222
486	2017/04/11	13:36:32	1.759	A	4.7654	V	1.35
487	2017/04/11	13:36:42	1.734	A	4.7764	V	1.352778
488	2017/04/11	13:36:52	1.772	A	4.7644	V	1.355556
489	2017/04/11	13:37:02	1.678	A	4.7576	V	1.358333
490	2017/04/11	13:37:12	1.724	A	4.7717	V	1.361111
491	2017/04/11	13:37:22	1.746	A	4.7614	V	1.363889
492	2017/04/11	13:37:32	1.729	A	4.7738	V	1.366667
493	2017/04/11	13:37:42	1.704	A	4.7634	V	1.369444
494	2017/04/11	13:37:52	1.727	A	4.7675	V	1.372222
495	2017/04/11	13:38:02	1.723	A	4.7697	V	1.375
496	2017/04/11	13:38:12	1.707	A	4.7705	V	1.377778
497	2017/04/11	13:38:22	1.679	A	4.7587	V	1.380556
498	2017/04/11	13:38:32	1.681	A	4.7651	V	1.383333
499	2017/04/11	13:38:42	1.685	A	4.7606	V	1.386111
500	2017/04/11	13:38:52	1.704	A	4.7657	V	1.388889
501	2017/04/11	13:39:02	1.76	A	4.7717	V	1.391667
502	2017/04/11	13:39:12	1.714	A	4.7648	V	1.394444
503	2017/04/11	13:39:22	1.722	A	4.7695	V	1.397222
504	2017/04/11	13:39:32	1.716	A	4.7697	V	1.4
505	2017/04/11	13:39:42	1.687	A	4.7657	V	1.402778
506	2017/04/11	13:39:52	1.725	A	4.7665	V	1.405556
507	2017/04/11	13:40:02	1.697	A	4.7688	V	1.408333
508	2017/04/11	13:40:12	1.671	A	4.7677	V	1.411111
509	2017/04/11	13:40:22	1.672	A	4.7675	V	1.413889
510	2017/04/11	13:40:32	1.75	A	4.7656	V	1.416667
511	2017/04/11	13:40:42	1.749	A	4.7628	V	1.419444
512	2017/04/11	13:40:52	1.693	A	4.7679	V	1.422222
513	2017/04/11	13:41:02	1.669	A	4.7724	V	1.425
514	2017/04/11	13:41:12	1.67	A	4.7736	V	1.427778
515	2017/04/11	13:41:22	1.777	A	4.7714	V	1.430556
516	2017/04/11	13:41:32	1.754	A	4.7732	V	1.433333
517	2017/04/11	13:41:42	1.732	A	4.7727	V	1.436111
518	2017/04/11	13:41:52	1.731	A	4.7648	V	1.438889
519	2017/04/11	13:42:02	1.703	A	4.7676	V	1.441667
520	2017/04/11	13:42:12	1.658	A	4.7597	V	1.444444
521	2017/04/11	13:42:22	1.71	A	4.7701	V	1.447222
522	2017/04/11	13:42:32	1.719	A	4.7622	V	1.45
523	2017/04/11	13:42:42	1.766	A	4.7646	V	1.452778
524	2017/04/11	13:42:52	1.704	A	4.76	V	1.455556
525	2017/04/11	13:43:02	1.696	A	4.7668	V	1.458333
526	2017/04/11	13:43:12	1.722	A	4.7596	V	1.461111
527	2017/04/11	13:43:22	1.746	A	4.7605	V	1.463889
528	2017/04/11	13:43:32	1.669	A	4.7663	V	1.466667
529	2017/04/11	13:43:42	1.724	A	4.7736	V	1.469444
530	2017/04/11	13:43:52	1.754	A	4.7527	V	1.472222
531	2017/04/11	13:44:02	1.749	A	4.7679	V	1.475
532	2017/04/11	13:44:12	1.721	A	4.7699	V	1.477778
533	2017/04/11	13:44:22	1.696	A	4.7641	V	1.480556
534	2017/04/11	13:44:32	1.762	A	4.7555	V	1.483333
535	2017/04/11	13:44:42	1.684	A	4.7681	V	1.486111
536	2017/04/11	13:44:52	1.69	A	4.7704	V	1.488889
537	2017/04/11	13:45:02	1.697	A	4.765	V	1.491667
538	2017/04/11	13:45:12	1.669	A	4.7703	V	1.494444
539	2017/04/11	13:45:22	1.761	A	4.7677	V	1.497222
540	2017/04/11	13:45:32	1.685	A	4.7636	V	1.5
541	2017/04/11	13:45:42	1.745	A	4.7657	V	1.502778
542	2017/04/11	13:45:52	1.74	A	4.7573	V	1.505556
543	2017/04/11	13:46:02	1.759	A	4.7642	V	1.508333
544	2017/04/11	13:46:12	1.724	A	4.7724	V	1.511111
545	2017/04/11	13:46:22	1.733	A	4.7558	V	1.513889
546	2017/04/11	13:46:32	1.728	A	4.7686	V	1.516667
547	2017/04/11	13:46:42	1.731	A	4.7658	V	1.519444
548	2017/04/11	13:46:52	1.714	A	4.7589	V	1.522222
549	2017/04/11	13:47:02	1.763	A	4.7725	V	1.525
550	2017/04/11	13:47:12	1.749	A	4.7584	V	1.527778
551	2017/04/11	13:47:22	1.744	A	4.7605	V	1.530556
552	2017/04/11	13:47:32	1.709	A	4.7671	V	1.533333
553	2017/04/11	13:47:42	1.727	A	4.7638	V	1.536111
554	2017/04/11	13:47:52	1.772	A	4.7676	V	1.538889
555	2017/04/11	13:48:02	1.732	A	4.7691	V	1.541667
556	2017/04/11	13:48:12	1.778	A	4.7627	V	1.544444
557	2017/04/11	13:48:22	1.761	A	4.7628	V	1.547222

558	2017/04/11	13:48:32	1.719	A	4.7709	V	1.55
559	2017/04/11	13:48:42	1.728	A	4.7647	V	1.552778
560	2017/04/11	13:48:52	1.711	A	4.766	V	1.555556
561	2017/04/11	13:49:02	1.726	A	4.7617	V	1.558333
562	2017/04/11	13:49:12	1.726	A	4.7647	V	1.561111
563	2017/04/11	13:49:22	1.707	A	4.7662	V	1.563889
564	2017/04/11	13:49:32	1.758	A	4.7626	V	1.566667
565	2017/04/11	13:49:42	1.71	A	4.7697	V	1.569444
566	2017/04/11	13:49:52	1.707	A	4.7661	V	1.572222
567	2017/04/11	13:50:02	1.707	A	4.7655	V	1.575
568	2017/04/11	13:50:12	1.672	A	4.77	V	1.577778
569	2017/04/11	13:50:22	1.676	A	4.7669	V	1.580556
570	2017/04/11	13:50:32	1.698	A	4.773	V	1.583333
571	2017/04/11	13:50:42	1.697	A	4.7632	V	1.586111
572	2017/04/11	13:50:52	1.678	A	4.7647	V	1.588889
573	2017/04/11	13:51:02	1.736	A	4.761	V	1.591667
574	2017/04/11	13:51:12	1.75	A	4.7693	V	1.594444
575	2017/04/11	13:51:22	1.735	A	4.7651	V	1.597222
576	2017/04/11	13:51:32	1.718	A	4.7681	V	1.6
577	2017/04/11	13:51:42	1.704	A	4.7757	V	1.602778
578	2017/04/11	13:51:52	1.697	A	4.7704	V	1.605556
579	2017/04/11	13:52:02	1.747	A	4.7657	V	1.608333
580	2017/04/11	13:52:12	1.752	A	4.7682	V	1.611111
581	2017/04/11	13:52:22	1.724	A	4.7558	V	1.613889
582	2017/04/11	13:52:32	1.787	A	4.7634	V	1.616667
583	2017/04/11	13:52:42	1.708	A	4.7674	V	1.619444
584	2017/04/11	13:52:52	1.698	A	4.7672	V	1.622222
585	2017/04/11	13:53:02	1.704	A	4.7639	V	1.625
586	2017/04/11	13:53:12	1.732	A	4.7752	V	1.627778
587	2017/04/11	13:53:22	1.746	A	4.7576	V	1.630556
588	2017/04/11	13:53:32	1.74	A	4.7733	V	1.633333
589	2017/04/11	13:53:42	1.67	A	4.7685	V	1.636111
590	2017/04/11	13:53:52	1.727	A	4.7697	V	1.638889
591	2017/04/11	13:54:02	1.676	A	4.7688	V	1.641667
592	2017/04/11	13:54:12	1.662	A	4.7689	V	1.644444
593	2017/04/11	13:54:22	1.722	A	4.7652	V	1.647222
594	2017/04/11	13:54:32	1.748	A	4.7646	V	1.65
595	2017/04/11	13:54:42	1.745	A	4.7658	V	1.652778
596	2017/04/11	13:54:52	1.717	A	4.7641	V	1.655556
597	2017/04/11	13:55:02	1.723	A	4.7608	V	1.658333
598	2017/04/11	13:55:12	1.72	A	4.7645	V	1.661111
599	2017/04/11	13:55:22	1.684	A	4.7663	V	1.663889
600	2017/04/11	13:55:32	1.704	A	4.7611	V	1.666667
601	2017/04/11	13:55:42	1.721	A	4.765	V	1.669444
602	2017/04/11	13:55:52	1.72	A	4.7663	V	1.672222
603	2017/04/11	13:56:02	1.694	A	4.7687	V	1.675
604	2017/04/11	13:56:12	1.742	A	4.7674	V	1.677778
605	2017/04/11	13:56:22	1.685	A	4.7636	V	1.680556
606	2017/04/11	13:56:32	1.681	A	4.7698	V	1.683333
607	2017/04/11	13:56:42	1.697	A	4.7737	V	1.686111
608	2017/04/11	13:56:52	1.689	A	4.7731	V	1.688889
609	2017/04/11	13:57:02	1.747	A	4.7666	V	1.691667
610	2017/04/11	13:57:12	1.712	A	4.7663	V	1.694444
611	2017/04/11	13:57:22	1.698	A	4.771	V	1.697222
612	2017/04/11	13:57:32	1.716	A	4.7656	V	1.7
613	2017/04/11	13:57:42	1.693	A	4.7697	V	1.702778
614	2017/04/11	13:57:52	1.725	A	4.7686	V	1.705556
615	2017/04/11	13:58:02	1.704	A	4.7686	V	1.708333
616	2017/04/11	13:58:12	1.686	A	4.7695	V	1.711111
617	2017/04/11	13:58:22	1.725	A	4.7733	V	1.713889
618	2017/04/11	13:58:32	1.739	A	4.7589	V	1.716667
619	2017/04/11	13:58:42	1.807	A	4.7545	V	1.719444
620	2017/04/11	13:58:52	1.702	A	4.7607	V	1.722222
621	2017/04/11	13:59:02	1.671	A	4.7613	V	1.725
622	2017/04/11	13:59:12	1.702	A	4.7682	V	1.727778
623	2017/04/11	13:59:22	1.722	A	4.7674	V	1.730556
624	2017/04/11	13:59:32	1.685	A	4.7698	V	1.733333
625	2017/04/11	13:59:42	1.705	A	4.7688	V	1.736111
626	2017/04/11	13:59:52	1.712	A	4.7591	V	1.738889
627	2017/04/11	14:00:02	1.679	A	4.7671	V	1.741667
628	2017/04/11	14:00:12	1.717	A	4.7632	V	1.744444
629	2017/04/11	14:00:22	1.681	A	4.769	V	1.747222
630	2017/04/11	14:00:32	1.665	A	4.7703	V	1.75
631	2017/04/11	14:00:42	1.696	A	4.7679	V	1.752778
632	2017/04/11	14:00:52	1.682	A	4.7697	V	1.755556
633	2017/04/11	14:01:02	1.704	A	4.7575	V	1.758333
634	2017/04/11	14:01:12	1.681	A	4.7678	V	1.761111
635	2017/04/11	14:01:22	1.682	A	4.7743	V	1.763889
636	2017/04/11	14:01:32	1.678	A	4.7637	V	1.766667
637	2017/04/11	14:01:42	1.666	A	4.7687	V	1.769444
638	2017/04/11	14:01:52	1.674	A	4.7636	V	1.772222
639	2017/04/11	14:02:02	1.676	A	4.7757	V	1.775
640	2017/04/11	14:02:12	1.689	A	4.7629	V	1.777778
641	2017/04/11	14:02:22	1.701	A	4.7636	V	1.780556
642	2017/04/11	14:02:32	1.667	A	4.7613	V	1.783333
643	2017/04/11	14:02:42	1.701	A	4.7711	V	1.786111
644	2017/04/11	14:02:52	1.67	A	4.7714	V	1.788889
645	2017/04/11	14:03:02	1.667	A	4.7645	V	1.791667
646	2017/04/11	14:03:12	1.731	A	4.7616	V	1.794444
647	2017/04/11	14:03:22	1.78	A	4.7595	V	1.797222
648	2017/04/11	14:03:32	1.746	A	4.7682	V	1.8
649	2017/04/11	14:03:42	1.703	A	4.7706	V	1.802778
650	2017/04/11	14:03:52	1.659	A	4.7715	V	1.805556
651	2017/04/11	14:04:02	1.651	A	4.7611	V	1.808333

652	2017/04/11	14 04:12	1.703	A	4.7726	V	1.811111
653	2017/04/11	14 04:22	1.701	A	4.768	V	1.813889
654	2017/04/11	14 04:32	1.695	A	4.7712	V	1.816667
655	2017/04/11	14 04:42	1.689	A	4.7696	V	1.819444
656	2017/04/11	14 04:52	1.674	A	4.769	V	1.822222
657	2017/04/11	14 05:02	1.732	A	4.7722	V	1.825
658	2017/04/11	14 05:12	1.692	A	4.7667	V	1.827778
659	2017/04/11	14 05:22	1.683	A	4.7561	V	1.830556
660	2017/04/11	14 05:32	1.694	A	4.7755	V	1.833333
661	2017/04/11	14 05:42	1.686	A	4.7694	V	1.836111
662	2017/04/11	14 05:52	1.707	A	4.7697	V	1.838889
663	2017/04/11	14 06:02	1.749	A	4.7716	V	1.841667
664	2017/04/11	14 06:12	1.761	A	4.76	V	1.844444
665	2017/04/11	14 06:22	1.674	A	4.7742	V	1.847222
666	2017/04/11	14 06:32	1.684	A	4.7607	V	1.85
667	2017/04/11	14 06:42	1.694	A	4.761	V	1.852778
668	2017/04/11	14 06:52	1.679	A	4.7725	V	1.855556
669	2017/04/11	14 07:02	1.711	A	4.7651	V	1.858333
670	2017/04/11	14 07:12	1.653	A	4.7689	V	1.861111
671	2017/04/11	14 07:22	1.738	A	4.7712	V	1.863889
672	2017/04/11	14 07:32	1.742	A	4.7667	V	1.866667
673	2017/04/11	14 07:42	1.745	A	4.7653	V	1.869444
674	2017/04/11	14 07:52	1.755	A	4.7642	V	1.872222
675	2017/04/11	14 08:02	1.661	A	4.7675	V	1.875
676	2017/04/11	14 08:12	1.686	A	4.776	V	1.877778
677	2017/04/11	14 08:22	1.692	A	4.7668	V	1.880556
678	2017/04/11	14 08:32	1.738	A	4.7647	V	1.883333
679	2017/04/11	14 08:42	1.688	A	4.771	V	1.886111
680	2017/04/11	14 08:52	1.762	A	4.7637	V	1.888889
681	2017/04/11	14 09:02	1.693	A	4.7765	V	1.891667
682	2017/04/11	14 09:12	1.669	A	4.7689	V	1.894444
683	2017/04/11	14 09:22	1.756	A	4.7694	V	1.897222
684	2017/04/11	14 09:32	1.719	A	4.7737	V	1.9
685	2017/04/11	14 09:42	1.663	A	4.7673	V	1.902778
686	2017/04/11	14 09:52	1.692	A	4.7718	V	1.905556
687	2017/04/11	14:10:02	1.778	A	4.7647	V	1.908333
688	2017/04/11	14:10:12	1.721	A	4.7669	V	1.911111
689	2017/04/11	14:10:22	1.72	A	4.7607	V	1.913889
690	2017/04/11	14:10:32	1.685	A	4.7562	V	1.916667
691	2017/04/11	14:10:42	1.658	A	4.7703	V	1.919444
692	2017/04/11	14:10:52	1.714	A	4.7689	V	1.922222
693	2017/04/11	14:11:02	1.724	A	4.758	V	1.925
694	2017/04/11	14:11:12	1.748	A	4.7633	V	1.927778
695	2017/04/11	14:11:22	1.719	A	4.7564	V	1.930556
696	2017/04/11	14:11:32	1.708	A	4.7606	V	1.933333
697	2017/04/11	14:11:42	1.731	A	4.7548	V	1.936111
698	2017/04/11	14:11:52	1.725	A	4.7636	V	1.938889
699	2017/04/11	14:12:02	1.769	A	4.7643	V	1.941667
700	2017/04/11	14:12:12	1.748	A	4.7711	V	1.944444
701	2017/04/11	14:12:22	1.755	A	4.7668	V	1.947222
702	2017/04/11	14:12:32	1.766	A	4.7596	V	1.95
703	2017/04/11	14:12:42	1.705	A	4.7577	V	1.952778
704	2017/04/11	14:12:52	1.656	A	4.7593	V	1.955556
705	2017/04/11	14:13:02	1.668	A	4.7732	V	1.958333
706	2017/04/11	14:13:12	1.664	A	4.7619	V	1.961111
707	2017/04/11	14:13:22	1.725	A	4.7573	V	1.963889
708	2017/04/11	14:13:32	1.754	A	4.7635	V	1.966667
709	2017/04/11	14:13:42	1.717	A	4.7673	V	1.969444
710	2017/04/11	14:13:52	1.68	A	4.7587	V	1.972222
711	2017/04/11	14:14:02	1.725	A	4.753	V	1.975
712	2017/04/11	14:14:12	1.685	A	4.7535	V	1.977778
713	2017/04/11	14:14:22	1.739	A	4.7612	V	1.980556
714	2017/04/11	14:14:32	1.693	A	4.763	V	1.983333
715	2017/04/11	14:14:42	1.679	A	4.7641	V	1.986111
716	2017/04/11	14:14:52	1.768	A	4.7555	V	1.988889
717	2017/04/11	14:15:02	1.737	A	4.7645	V	1.991667
718	2017/04/11	14:15:12	1.71	A	4.7638	V	1.994444
719	2017/04/11	14:15:22	1.792	A	4.7585	V	1.997222
720	2017/04/11	14:15:32	1.699	A	4.7653	V	2
721	2017/04/11	14:15:42	1.726	A	4.772	V	2.002778
722	2017/04/11	14:15:52	1.728	A	4.7536	V	2.005556
723	2017/04/11	14:16:02	1.704	A	4.7689	V	2.008333
724	2017/04/11	14:16:12	1.713	A	4.7707	V	2.011111
725	2017/04/11	14:16:22	1.689	A	4.7639	V	2.013889
726	2017/04/11	14:16:32	1.763	A	4.7656	V	2.016667
727	2017/04/11	14:16:42	1.761	A	4.7581	V	2.019444
728	2017/04/11	14:16:52	1.737	A	4.7593	V	2.022222
729	2017/04/11	14:17:02	1.687	A	4.7669	V	2.025
730	2017/04/11	14:17:12	1.705	A	4.7687	V	2.027778
731	2017/04/11	14:17:22	1.711	A	4.7688	V	2.030556
732	2017/04/11	14:17:32	1.742	A	4.7695	V	2.033333
733	2017/04/11	14:17:42	1.775	A	4.7616	V	2.036111
734	2017/04/11	14:17:52	1.746	A	4.7548	V	2.038889
735	2017/04/11	14:18:02	1.68	A	4.777	V	2.041667
736	2017/04/11	14:18:12	1.675	A	4.7651	V	2.044444
737	2017/04/11	14:18:22	1.716	A	4.7606	V	2.047222
738	2017/04/11	14:18:32	1.699	A	4.7668	V	2.05
739	2017/04/11	14:18:42	1.693	A	4.7703	V	2.052778
740	2017/04/11	14:18:52	1.701	A	4.7729	V	2.055556
741	2017/04/11	14:19:02	1.727	A	4.7627	V	2.058333
742	2017/04/11	14:19:12	1.729	A	4.761	V	2.061111
743	2017/04/11	14:19:22	1.732	A	4.7604	V	2.063889
744	2017/04/11	14:19:32	1.718	A	4.7672	V	2.066667
745	2017/04/11	14:19:42	1.726	A	4.7705	V	2.069444

746	2017/04/11	14:19 52	1.735 A	4.7637 V	2.072222
747	2017/04/11	14:20 02	1.683 A	4.77 V	2.075
748	2017/04/11	14:20:12	1.744 A	4.7685 V	2.077778
749	2017/04/11	14:20:22	1.745 A	4.763 V	2.080556
750	2017/04/11	14:20:32	1.658 A	4.7644 V	2.083333
751	2017/04/11	14:20:42	1.72 A	4.7571 V	2.086111
752	2017/04/11	14:20 52	1.712 A	4.7657 V	2.088889
753	2017/04/11	14:21 02	1.731 A	4.7725 V	2.091667
754	2017/04/11	14:21:12	1.692 A	4.7683 V	2.094444
755	2017/04/11	14:21:22	1.665 A	4.774 V	2.097222
756	2017/04/11	14:21:32	1.687 A	4.765 V	2.1
757	2017/04/11	14:21:42	1.73 A	4.7551 V	2.102778
758	2017/04/11	14:21 52	1.722 A	4.7677 V	2.105556
759	2017/04/11	14:22 02	1.684 A	4.7719 V	2.108333
760	2017/04/11	14:22:12	1.7 A	4.7627 V	2.111111
761	2017/04/11	14:22:22	1.68 A	4.7683 V	2.113889
762	2017/04/11	14:22:32	1.735 A	4.7686 V	2.116667
763	2017/04/11	14:22:42	1.688 A	4.7678 V	2.119444
764	2017/04/11	14:22 52	1.715 A	4.7671 V	2.122222
765	2017/04/11	14:23 02	1.675 A	4.761 V	2.125
766	2017/04/11	14:23:12	1.73 A	4.7643 V	2.127778
767	2017/04/11	14:23:22	1.753 A	4.7681 V	2.130556
768	2017/04/11	14:23:32	1.704 A	4.7633 V	2.133333
769	2017/04/11	14:23:42	1.704 A	4.7614 V	2.136111
770	2017/04/11	14:23 52	1.733 A	4.7698 V	2.138889
771	2017/04/11	14:24 02	1.673 A	4.7665 V	2.141667
772	2017/04/11	14:24:12	1.73 A	4.7606 V	2.144444
773	2017/04/11	14:24:22	1.758 A	4.7725 V	2.147222
774	2017/04/11	14:24:32	1.745 A	4.7589 V	2.15
775	2017/04/11	14:24:42	1.696 A	4.7698 V	2.152778
776	2017/04/11	14:24 52	1.727 A	4.7634 V	2.155556
777	2017/04/11	14:25 02	1.709 A	4.7699 V	2.158333
778	2017/04/11	14:25:12	1.702 A	4.7695 V	2.161111
779	2017/04/11	14:25:22	1.692 A	4.7716 V	2.163889
780	2017/04/11	14:25:32	1.671 A	4.763 V	2.166667
781	2017/04/11	14:25:42	1.743 A	4.766 V	2.169444
782	2017/04/11	14:25 52	1.743 A	4.7559 V	2.172222
783	2017/04/11	14:26 02	1.676 A	4.7714 V	2.175
784	2017/04/11	14:26:12	1.711 A	4.7709 V	2.177778
785	2017/04/11	14:26:22	1.674 A	4.7691 V	2.180556
786	2017/04/11	14:26:32	1.684 A	4.7665 V	2.183333
787	2017/04/11	14:26:42	1.669 A	4.7625 V	2.186111
788	2017/04/11	14:26 52	1.71 A	4.7658 V	2.188889
789	2017/04/11	14:27 02	1.673 A	4.7606 V	2.191667
790	2017/04/11	14:27:12	1.681 A	4.7695 V	2.194444
791	2017/04/11	14:27:22	1.726 A	4.7645 V	2.197222
792	2017/04/11	14:27:32	1.744 A	4.7529 V	2.2
793	2017/04/11	14:27:42	1.74 A	4.7627 V	2.202778
794	2017/04/11	14:27 52	1.685 A	4.7644 V	2.205556
795	2017/04/11	14:28 02	1.691 A	4.7643 V	2.208333
796	2017/04/11	14:28:12	1.718 A	4.7589 V	2.211111
797	2017/04/11	14:28:22	1.741 A	4.7656 V	2.213889
798	2017/04/11	14:28:32	1.67 A	4.7614 V	2.216667
799	2017/04/11	14:28:42	1.666 A	4.7716 V	2.219444
800	2017/04/11	14:28 52	1.68 A	4.7657 V	2.222222
801	2017/04/11	14:29 02	1.682 A	4.7659 V	2.225
802	2017/04/11	14:29:12	1.744 A	4.7687 V	2.227778
803	2017/04/11	14:29:22	1.66 A	4.7656 V	2.230556
804	2017/04/11	14:29:32	1.693 A	4.7702 V	2.233333
805	2017/04/11	14:29:42	1.687 A	4.7657 V	2.236111
806	2017/04/11	14:29 52	1.673 A	4.7717 V	2.238889
807	2017/04/11	14:30 02	1.727 A	4.7648 V	2.241667
808	2017/04/11	14:30:12	1.715 A	4.7702 V	2.244444
809	2017/04/11	14:30:22	1.721 A	4.7691 V	2.247222
810	2017/04/11	14:30:32	1.739 A	4.7561 V	2.25
811	2017/04/11	14:30:42	1.711 A	4.7628 V	2.252778
812	2017/04/11	14:30 52	1.724 A	4.7589 V	2.255556
813	2017/04/11	14:31 02	1.738 A	4.7697 V	2.258333
814	2017/04/11	14:31:12	1.689 A	4.7674 V	2.261111
815	2017/04/11	14:31:22	1.704 A	4.7644 V	2.263889
816	2017/04/11	14:31:32	1.731 A	4.7719 V	2.266667
817	2017/04/11	14:31:42	1.746 A	4.7675 V	2.269444
818	2017/04/11	14:31 52	1.674 A	4.7614 V	2.272222
819	2017/04/11	14:32 02	1.652 A	4.7634 V	2.275
820	2017/04/11	14:32:12	1.678 A	4.7743 V	2.277778
821	2017/04/11	14:32:22	1.694 A	4.7656 V	2.280556
822	2017/04/11	14:32:32	1.709 A	4.7693 V	2.283333
823	2017/04/11	14:32:42	1.694 A	4.7688 V	2.286111
824	2017/04/11	14:32 52	1.686 A	4.7739 V	2.288889
825	2017/04/11	14:33 02	1.77 A	4.757 V	2.291667
826	2017/04/11	14:33:12	1.713 A	4.7642 V	2.294444
827	2017/04/11	14:33:22	1.694 A	4.7601 V	2.297222
828	2017/04/11	14:33:32	1.671 A	4.7653 V	2.3
829	2017/04/11	14:33:42	1.65 A	4.7736 V	2.302778
830	2017/04/11	14:33 52	1.741 A	4.7735 V	2.305556
831	2017/04/11	14:34 02	1.74 A	4.7754 V	2.308333
832	2017/04/11	14:34:12	1.697 A	4.7624 V	2.311111
833	2017/04/11	14:34:22	1.711 A	4.7504 V	2.313889
834	2017/04/11	14:34:32	1.737 A	4.7575 V	2.316667
835	2017/04/11	14:34:42	1.69 A	4.7729 V	2.319444
836	2017/04/11	14:34 52	1.713 A	4.7718 V	2.322222
837	2017/04/11	14:35 02	1.685 A	4.7695 V	2.325
838	2017/04/11	14:35:12	1.674 A	4.7707 V	2.327778
839	2017/04/11	14:35:22	1.728 A	4.7628 V	2.330556

840	2017/04/11	14:35:32	1.676	A	4.7549	V	2.333333
841	2017/04/11	14:35:42	1.771	A	4.7602	V	2.336111
842	2017/04/11	14:35:52	1.714	A	4.7739	V	2.338889
843	2017/04/11	14:36:02	1.665	A	4.7724	V	2.341667
844	2017/04/11	14:36:12	1.688	A	4.7699	V	2.344444
845	2017/04/11	14:36:22	1.68	A	4.7652	V	2.347222
846	2017/04/11	14:36:32	1.71	A	4.7621	V	2.35
847	2017/04/11	14:36:42	1.728	A	4.7696	V	2.352778
848	2017/04/11	14:36:52	1.707	A	4.7755	V	2.355556
849	2017/04/11	14:37:02	1.765	A	4.7715	V	2.358333
850	2017/04/11	14:37:12	1.689	A	4.7633	V	2.361111
851	2017/04/11	14:37:22	1.751	A	4.7598	V	2.363889
852	2017/04/11	14:37:32	1.749	A	4.7701	V	2.366667
853	2017/04/11	14:37:42	1.695	A	4.7653	V	2.369444
854	2017/04/11	14:37:52	1.743	A	4.7737	V	2.372222
855	2017/04/11	14:38:02	1.755	A	4.7686	V	2.375
856	2017/04/11	14:38:12	1.77	A	4.7593	V	2.377778
857	2017/04/11	14:38:22	1.672	A	4.7566	V	2.380556
858	2017/04/11	14:38:32	1.728	A	4.7569	V	2.383333
859	2017/04/11	14:38:42	1.691	A	4.7682	V	2.386111
860	2017/04/11	14:38:52	1.724	A	4.7724	V	2.388889
861	2017/04/11	14:39:02	1.722	A	4.7613	V	2.391667
862	2017/04/11	14:39:12	1.729	A	4.7701	V	2.394444
863	2017/04/11	14:39:22	1.687	A	4.7679	V	2.397222
864	2017/04/11	14:39:32	1.72	A	4.7582	V	2.4
865	2017/04/11	14:39:42	1.746	A	4.7648	V	2.402778
866	2017/04/11	14:39:52	1.784	A	4.7653	V	2.405556
867	2017/04/11	14:40:02	1.691	A	4.7653	V	2.408333
868	2017/04/11	14:40:12	1.694	A	4.7695	V	2.411111
869	2017/04/11	14:40:22	1.699	A	4.7698	V	2.413889
870	2017/04/11	14:40:32	1.711	A	4.7562	V	2.416667
871	2017/04/11	14:40:42	1.771	A	4.7675	V	2.419444
872	2017/04/11	14:40:52	1.679	A	4.7642	V	2.422222
873	2017/04/11	14:41:02	1.678	A	4.76	V	2.425
874	2017/04/11	14:41:12	1.69	A	4.7649	V	2.427778
875	2017/04/11	14:41:22	1.741	A	4.7707	V	2.430556
876	2017/04/11	14:41:32	1.7	A	4.7664	V	2.433333
877	2017/04/11	14:41:42	1.763	A	4.7726	V	2.436111
878	2017/04/11	14:41:52	1.682	A	4.7685	V	2.438889
879	2017/04/11	14:42:02	1.715	A	4.7705	V	2.441667
880	2017/04/11	14:42:12	1.751	A	4.7665	V	2.444444
881	2017/04/11	14:42:22	1.697	A	4.7742	V	2.447222
882	2017/04/11	14:42:32	1.699	A	4.7696	V	2.45
883	2017/04/11	14:42:42	1.676	A	4.763	V	2.452778
884	2017/04/11	14:42:52	1.718	A	4.7651	V	2.455556
885	2017/04/11	14:43:02	1.733	A	4.7687	V	2.458333
886	2017/04/11	14:43:12	1.767	A	4.765	V	2.461111
887	2017/04/11	14:43:22	1.704	A	4.7727	V	2.463889
888	2017/04/11	14:43:32	1.731	A	4.7609	V	2.466667
889	2017/04/11	14:43:42	1.704	A	4.7607	V	2.469444
890	2017/04/11	14:43:52	1.707	A	4.7718	V	2.472222
891	2017/04/11	14:44:02	1.715	A	4.7695	V	2.475
892	2017/04/11	14:44:12	1.717	A	4.7653	V	2.477778
893	2017/04/11	14:44:22	1.746	A	4.7669	V	2.480556
894	2017/04/11	14:44:32	1.718	A	4.7672	V	2.483333
895	2017/04/11	14:44:42	1.729	A	4.7615	V	2.486111
896	2017/04/11	14:44:52	1.671	A	4.7605	V	2.488889
897	2017/04/11	14:45:02	1.707	A	4.7735	V	2.491667
898	2017/04/11	14:45:12	1.705	A	4.7652	V	2.494444
899	2017/04/11	14:45:22	1.727	A	4.7703	V	2.497222
900	2017/04/11	14:45:32	1.739	A	4.7696	V	2.5
901	2017/04/11	14:45:42	1.711	A	4.7682	V	2.502778
902	2017/04/11	14:45:52	1.746	A	4.765	V	2.505556
903	2017/04/11	14:46:02	1.666	A	4.7592	V	2.508333
904	2017/04/11	14:46:12	1.7	A	4.7618	V	2.511111
905	2017/04/11	14:46:22	1.704	A	4.7639	V	2.513889
906	2017/04/11	14:46:32	1.687	A	4.7638	V	2.516667
907	2017/04/11	14:46:42	1.681	A	4.7679	V	2.519444
908	2017/04/11	14:46:52	1.693	A	4.7662	V	2.522222
909	2017/04/11	14:47:02	1.674	A	4.7565	V	2.525
910	2017/04/11	14:47:12	1.724	A	4.7616	V	2.527778
911	2017/04/11	14:47:22	1.696	A	4.7691	V	2.530556
912	2017/04/11	14:47:32	1.681	A	4.7692	V	2.533333
913	2017/04/11	14:47:42	1.657	A	4.7619	V	2.536111
914	2017/04/11	14:47:52	1.748	A	4.7584	V	2.538889
915	2017/04/11	14:48:02	1.763	A	4.7692	V	2.541667
916	2017/04/11	14:48:12	1.729	A	4.7603	V	2.544444
917	2017/04/11	14:48:22	1.721	A	4.7714	V	2.547222
918	2017/04/11	14:48:32	1.748	A	4.7634	V	2.55
919	2017/04/11	14:48:42	1.695	A	4.7577	V	2.552778
920	2017/04/11	14:48:52	1.632	A	4.7497	V	2.555556
921	2017/04/11	14:49:02	1.507	A	4.752	V	2.558333
922	2017/04/11	14:49:12	1.529	A	4.7496	V	2.561111
923	2017/04/11	14:49:22	1.553	A	4.7485	V	2.563889
924	2017/04/11	14:49:32	1.597	A	4.7559	V	2.566667
925	2017/04/11	14:49:42	1.575	A	4.7451	V	2.569444
926	2017/04/11	14:49:52	1.535	A	4.7484	V	2.572222
927	2017/04/11	14:50:02	1.527	A	4.7356	V	2.575
928	2017/04/11	14:50:12	1.512	A	4.7536	V	2.577778
929	2017/04/11	14:50:22	1.554	A	4.748	V	2.580556
930	2017/04/11	14:50:32	1.559	A	4.7474	V	2.583333
931	2017/04/11	14:50:42	1.62	A	4.7554	V	2.586111
932	2017/04/11	14:50:52	1.586	A	4.7574	V	2.588889
933	2017/04/11	14:51:02	1.566	A	4.7382	V	2.591667

934	2017/04/11	14:51:12	1.631	A	4.7452	V	2.594444
935	2017/04/11	14:51:22	1.629	A	4.7328	V	2.597222
936	2017/04/11	14:51:32	1.547	A	4.7462	V	2.6
937	2017/04/11	14:51:42	1.566	A	4.7468	V	2.602778
938	2017/04/11	14:51:52	1.564	A	4.7511	V	2.605556
939	2017/04/11	14:52:02	1.552	A	4.7428	V	2.608333
940	2017/04/11	14:52:12	1.631	A	4.7479	V	2.611111
941	2017/04/11	14:52:22	1.613	A	4.7522	V	2.613889
942	2017/04/11	14:52:32	1.588	A	4.7346	V	2.616667
943	2017/04/11	14:52:42	1.632	A	4.7542	V	2.619444
944	2017/04/11	14:52:52	1.636	A	4.7615	V	2.622222
945	2017/04/11	14:53:02	1.634	A	4.753	V	2.625
946	2017/04/11	14:53:12	1.533	A	4.7606	V	2.627778
947	2017/04/11	14:53:22	1.57	A	4.7443	V	2.630556
948	2017/04/11	14:53:32	1.564	A	4.7545	V	2.633333
949	2017/04/11	14:53:42	1.59	A	4.7503	V	2.636111
950	2017/04/11	14:53:52	1.64	A	4.7454	V	2.638889
951	2017/04/11	14:54:02	1.6	A	4.7506	V	2.641667
952	2017/04/11	14:54:12	1.585	A	4.7545	V	2.644444
953	2017/04/11	14:54:22	1.566	A	4.7536	V	2.647222
954	2017/04/11	14:54:32	1.633	A	4.7506	V	2.65
955	2017/04/11	14:54:42	1.623	A	4.7504	V	2.652778
956	2017/04/11	14:54:52	1.588	A	4.7443	V	2.655556
957	2017/04/11	14:55:02	1.604	A	4.7488	V	2.658333
958	2017/04/11	14:55:12	1.612	A	4.7537	V	2.661111
959	2017/04/11	14:55:22	1.602	A	4.7434	V	2.663889
960	2017/04/11	14:55:32	1.603	A	4.7514	V	2.666667
961	2017/04/11	14:55:42	1.624	A	4.752	V	2.669444
962	2017/04/11	14:55:52	1.596	A	4.7503	V	2.672222
963	2017/04/11	14:56:02	1.58	A	4.746	V	2.675
964	2017/04/11	14:56:12	1.635	A	4.7554	V	2.677778
965	2017/04/11	14:56:22	1.57	A	4.7558	V	2.680556
966	2017/04/11	14:56:32	1.581	A	4.7607	V	2.683333
967	2017/04/11	14:56:42	1.578	A	4.7447	V	2.686111
968	2017/04/11	14:56:52	1.616	A	4.7458	V	2.688889
969	2017/04/11	14:57:02	1.588	A	4.7575	V	2.691667
970	2017/04/11	14:57:12	1.604	A	4.7432	V	2.694444
971	2017/04/11	14:57:22	1.617	A	4.7526	V	2.697222
972	2017/04/11	14:57:32	1.574	A	4.7466	V	2.7
973	2017/04/11	14:57:42	1.589	A	4.7554	V	2.702778
974	2017/04/11	14:57:52	1.613	A	4.7538	V	2.705556
975	2017/04/11	14:58:02	1.628	A	4.7468	V	2.708333
976	2017/04/11	14:58:12	1.601	A	4.7437	V	2.711111
977	2017/04/11	14:58:22	1.623	A	4.7398	V	2.713889
978	2017/04/11	14:58:32	1.645	A	4.7518	V	2.716667
979	2017/04/11	14:58:42	1.636	A	4.7439	V	2.719444
980	2017/04/11	14:58:52	1.626	A	4.7408	V	2.722222
981	2017/04/11	14:59:02	1.586	A	4.7561	V	2.725
982	2017/04/11	14:59:12	1.595	A	4.7525	V	2.727778
983	2017/04/11	14:59:22	1.604	A	4.7508	V	2.730556
984	2017/04/11	14:59:32	1.624	A	4.7572	V	2.733333
985	2017/04/11	14:59:42	1.642	A	4.749	V	2.736111
986	2017/04/11	14:59:52	1.677	A	4.7455	V	2.738889
987	2017/04/11	15:00:02	1.575	A	4.7413	V	2.741667
988	2017/04/11	15:00:12	1.64	A	4.7433	V	2.744444
989	2017/04/11	15:00:22	1.616	A	4.762	V	2.747222
990	2017/04/11	15:00:32	1.627	A	4.7468	V	2.75
991	2017/04/11	15:00:42	1.622	A	4.7558	V	2.752778
992	2017/04/11	15:00:52	1.574	A	4.7525	V	2.755556
993	2017/04/11	15:01:02	1.622	A	4.7521	V	2.758333
994	2017/04/11	15:01:12	1.648	A	4.7519	V	2.761111
995	2017/04/11	15:01:22	1.65	A	4.7461	V	2.763889
996	2017/04/11	15:01:32	1.6	A	4.7527	V	2.766667
997	2017/04/11	15:01:42	1.623	A	4.7574	V	2.769444
998	2017/04/11	15:01:52	1.626	A	4.7579	V	2.772222
999	2017/04/11	15:02:02	1.565	A	4.7552	V	2.775
1000	2017/04/11	15:02:12	1.645	A	4.7493	V	2.777778
1001	2017/04/11	15:02:22	1.641	A	4.7494	V	2.780556
1002	2017/04/11	15:02:32	1.588	A	4.7468	V	2.783333
1003	2017/04/11	15:02:42	1.632	A	4.7425	V	2.786111
1004	2017/04/11	15:02:52	1.578	A	4.7577	V	2.788889
1005	2017/04/11	15:03:02	1.586	A	4.7574	V	2.791667
1006	2017/04/11	15:03:12	1.608	A	4.7627	V	2.794444
1007	2017/04/11	15:03:22	1.639	A	4.7531	V	2.797222
1008	2017/04/11	15:03:32	1.625	A	4.7553	V	2.8
1009	2017/04/11	15:03:42	1.627	A	4.7473	V	2.802778
1010	2017/04/11	15:03:52	1.675	A	4.7474	V	2.805556
1011	2017/04/11	15:04:02	1.607	A	4.754	V	2.808333
1012	2017/04/11	15:04:12	1.596	A	4.7576	V	2.811111
1013	2017/04/11	15:04:22	1.617	A	4.7574	V	2.813889
1014	2017/04/11	15:04:32	1.624	A	4.7573	V	2.816667
1015	2017/04/11	15:04:42	1.622	A	4.76	V	2.819444
1016	2017/04/11	15:04:52	1.628	A	4.7492	V	2.822222
1017	2017/04/11	15:05:02	1.598	A	4.7526	V	2.825
1018	2017/04/11	15:05:12	1.6	A	4.7514	V	2.827778
1019	2017/04/11	15:05:22	1.645	A	4.75	V	2.830556
1020	2017/04/11	15:05:32	1.664	A	4.7603	V	2.833333
1021	2017/04/11	15:05:42	1.628	A	4.7535	V	2.836111
1022	2017/04/11	15:05:52	1.627	A	4.7646	V	2.838889
1023	2017/04/11	15:06:02	1.646	A	4.7467	V	2.841667
1024	2017/04/11	15:06:12	1.633	A	4.7534	V	2.844444
1025	2017/04/11	15:06:22	1.65	A	4.753	V	2.847222
1026	2017/04/11	15:06:32	1.605	A	4.7547	V	2.85
1027	2017/04/11	15:06:42	1.64	A	4.7508	V	2.852778

1028	2017/04/11	15:06:52	1.672	A	4.7482	V	2.855556
1029	2017/04/11	15:07:02	1.633	A	4.7445	V	2.858333
1030	2017/04/11	15:07:12	1.581	A	4.7597	V	2.861111
1031	2017/04/11	15:07:22	1.682	A	4.7464	V	2.863889
1032	2017/04/11	15:07:32	1.607	A	4.7519	V	2.866667
1033	2017/04/11	15:07:42	1.644	A	4.7517	V	2.869444
1034	2017/04/11	15:07:52	1.652	A	4.7553	V	2.872222
1035	2017/04/11	15:08:02	1.596	A	4.7501	V	2.875
1036	2017/04/11	15:08:12	1.593	A	4.7545	V	2.877778
1037	2017/04/11	15:08:22	1.615	A	4.7564	V	2.880556
1038	2017/04/11	15:08:32	1.659	A	4.7581	V	2.883333
1039	2017/04/11	15:08:42	1.681	A	4.7483	V	2.886111
1040	2017/04/11	15:08:52	1.647	A	4.7564	V	2.888889
1041	2017/04/11	15:09:02	1.633	A	4.7547	V	2.891667
1042	2017/04/11	15:09:12	1.603	A	4.7668	V	2.894444
1043	2017/04/11	15:09:22	1.606	A	4.7656	V	2.897222
1044	2017/04/11	15:09:32	1.618	A	4.7591	V	2.9
1045	2017/04/11	15:09:42	1.602	A	4.76	V	2.902778
1046	2017/04/11	15:09:52	1.609	A	4.7591	V	2.905556
1047	2017/04/11	15:10:02	1.62	A	4.7566	V	2.908333
1048	2017/04/11	15:10:12	1.616	A	4.7511	V	2.911111
1049	2017/04/11	15:10:22	1.612	A	4.7595	V	2.913889
1050	2017/04/11	15:10:32	1.616	A	4.7534	V	2.916667
1051	2017/04/11	15:10:42	1.567	A	4.762	V	2.919444
1052	2017/04/11	15:10:52	1.625	A	4.7623	V	2.922222
1053	2017/04/11	15:11:02	1.63	A	4.7576	V	2.925
1054	2017/04/11	15:11:12	1.63	A	4.7579	V	2.927778
1055	2017/04/11	15:11:22	1.638	A	4.7543	V	2.930556
1056	2017/04/11	15:11:32	1.598	A	4.7623	V	2.933333
1057	2017/04/11	15:11:42	1.608	A	4.7549	V	2.936111
1058	2017/04/11	15:11:52	1.63	A	4.753	V	2.938889
1059	2017/04/11	15:12:02	1.603	A	4.7636	V	2.941667
1060	2017/04/11	15:12:12	1.635	A	4.7567	V	2.944444
1061	2017/04/11	15:12:22	1.6	A	4.7603	V	2.947222
1062	2017/04/11	15:12:32	1.64	A	4.7559	V	2.95
1063	2017/04/11	15:12:42	1.631	A	4.7583	V	2.952778
1064	2017/04/11	15:12:52	1.616	A	4.7563	V	2.955556
1065	2017/04/11	15:13:02	1.606	A	4.7603	V	2.958333
1066	2017/04/11	15:13:12	1.612	A	4.7564	V	2.961111
1067	2017/04/11	15:13:22	1.582	A	4.7622	V	2.963889
1068	2017/04/11	15:13:32	1.601	A	4.7589	V	2.966667
1069	2017/04/11	15:13:42	1.608	A	4.7571	V	2.969444
1070	2017/04/11	15:13:52	1.62	A	4.7581	V	2.972222
1071	2017/04/11	15:14:02	1.6	A	4.7595	V	2.975
1072	2017/04/11	15:14:12	1.6	A	4.7575	V	2.977778
1073	2017/04/11	15:14:22	1.617	A	4.7577	V	2.980556
1074	2017/04/11	15:14:32	1.598	A	4.7568	V	2.983333
1075	2017/04/11	15:14:42	1.613	A	4.7592	V	2.986111
1076	2017/04/11	15:14:52	1.609	A	4.7595	V	2.988889
1077	2017/04/11	15:15:02	1.608	A	4.7589	V	2.991667
1078	2017/04/11	15:15:12	1.6	A	4.7574	V	2.994444
1079	2017/04/11	15:15:22	1.608	A	4.7607	V	2.997222
1080	2017/04/11	15:15:32	1.609	A	4.7571	V	3
1081	2017/04/11	15:15:42	1.62	A	4.7602	V	3.002778
1082	2017/04/11	15:15:52	1.609	A	4.7582	V	3.005556
1083	2017/04/11	15:16:02	1.611	A	4.7616	V	3.008333
1084	2017/04/11	15:16:12	1.621	A	4.7598	V	3.011111
1085	2017/04/11	15:16:22	1.605	A	4.7627	V	3.013889
1086	2017/04/11	15:16:32	1.63	A	4.758	V	3.016667
1087	2017/04/11	15:16:42	1.611	A	4.7596	V	3.019444
1088	2017/04/11	15:16:52	1.61	A	4.7558	V	3.022222
1089	2017/04/11	15:17:02	1.607	A	4.7518	V	3.025
1090	2017/04/11	15:17:12	1.62	A	4.7591	V	3.027778
1091	2017/04/11	15:17:22	1.586	A	4.7575	V	3.030556
1092	2017/04/11	15:17:32	1.622	A	4.7573	V	3.033333
1093	2017/04/11	15:17:42	1.603	A	4.7569	V	3.036111
1094	2017/04/11	15:17:52	1.604	A	4.7621	V	3.038889
1095	2017/04/11	15:18:02	1.584	A	4.7628	V	3.041667
1096	2017/04/11	15:18:12	1.597	A	4.761	V	3.044444
1097	2017/04/11	15:18:22	1.603	A	4.7632	V	3.047222
1098	2017/04/11	15:18:32	1.605	A	4.7544	V	3.05
1099	2017/04/11	15:18:42	1.607	A	4.7501	V	3.052778
1100	2017/04/11	15:18:52	1.6	A	4.7568	V	3.055556
1101	2017/04/11	15:19:02	1.601	A	4.7575	V	3.058333
1102	2017/04/11	15:19:12	1.6	A	4.7574	V	3.061111
1103	2017/04/11	15:19:22	1.611	A	4.7592	V	3.063889
1104	2017/04/11	15:19:32	1.604	A	4.7514	V	3.066667
1105	2017/04/11	15:19:42	1.625	A	4.7607	V	3.069444
1106	2017/04/11	15:19:52	1.595	A	4.7592	V	3.072222
1107	2017/04/11	15:20:02	1.612	A	4.7612	V	3.075
1108	2017/04/11	15:20:12	1.603	A	4.7579	V	3.077778
1109	2017/04/11	15:20:22	1.648	A	4.7611	V	3.080556
1110	2017/04/11	15:20:32	1.617	A	4.7537	V	3.083333
1111	2017/04/11	15:20:42	1.632	A	4.7567	V	3.086111
1112	2017/04/11	15:20:52	1.593	A	4.7614	V	3.088889
1113	2017/04/11	15:21:02	1.635	A	4.7565	V	3.091667
1114	2017/04/11	15:21:12	1.615	A	4.7581	V	3.094444
1115	2017/04/11	15:21:22	1.604	A	4.757	V	3.097222
1116	2017/04/11	15:21:32	1.606	A	4.7515	V	3.1
1117	2017/04/11	15:21:42	1.606	A	4.7571	V	3.102778
1118	2017/04/11	15:21:52	1.604	A	4.7543	V	3.105556
1119	2017/04/11	15:22:02	1.633	A	4.7549	V	3.108333
1120	2017/04/11	15:22:12	1.583	A	4.7589	V	3.111111
1121	2017/04/11	15:22:22	1.624	A	4.7582	V	3.113889

2nd Green Light On, 3rd Green Light Flashing.

1122	2017/04/11	15:22:32	1.632	A	4.7596	V	3.116667
1123	2017/04/11	15:22:42	1.606	A	4.7568	V	3.119444
1124	2017/04/11	15:22:52	1.612	A	4.7553	V	3.122222
1125	2017/04/11	15:23:02	1.625	A	4.7441	V	3.125
1126	2017/04/11	15:23:12	1.621	A	4.7531	V	3.127778
1127	2017/04/11	15:23:22	1.603	A	4.7571	V	3.130556
1128	2017/04/11	15:23:32	1.617	A	4.7569	V	3.133333
1129	2017/04/11	15:23:42	1.621	A	4.7591	V	3.136111
1130	2017/04/11	15:23:52	1.619	A	4.7604	V	3.138889
1131	2017/04/11	15:24:02	1.631	A	4.7572	V	3.141667
1132	2017/04/11	15:24:12	1.599	A	4.7532	V	3.144444
1133	2017/04/11	15:24:22	1.623	A	4.7584	V	3.147222
1134	2017/04/11	15:24:32	1.622	A	4.7628	V	3.15
1135	2017/04/11	15:24:42	1.604	A	4.7568	V	3.152778
1136	2017/04/11	15:24:52	1.616	A	4.7599	V	3.155556
1137	2017/04/11	15:25:02	1.6	A	4.7596	V	3.158333
1138	2017/04/11	15:25:12	1.621	A	4.7576	V	3.161111
1139	2017/04/11	15:25:22	1.592	A	4.759	V	3.163889
1140	2017/04/11	15:25:32	1.611	A	4.7533	V	3.166667
1141	2017/04/11	15:25:42	1.603	A	4.7606	V	3.169444
1142	2017/04/11	15:25:52	1.615	A	4.7558	V	3.172222
1143	2017/04/11	15:26:02	1.611	A	4.758	V	3.175
1144	2017/04/11	15:26:12	1.611	A	4.7553	V	3.177778
1145	2017/04/11	15:26:22	1.608	A	4.7642	V	3.180556
1146	2017/04/11	15:26:32	1.613	A	4.7576	V	3.183333
1147	2017/04/11	15:26:42	1.611	A	4.7571	V	3.186111
1148	2017/04/11	15:26:52	1.624	A	4.7562	V	3.188889
1149	2017/04/11	15:27:02	1.631	A	4.7596	V	3.191667
1150	2017/04/11	15:27:12	1.629	A	4.7555	V	3.194444
1151	2017/04/11	15:27:22	1.594	A	4.753	V	3.197222
1152	2017/04/11	15:27:32	1.639	A	4.7559	V	3.2
1153	2017/04/11	15:27:42	1.619	A	4.7531	V	3.202778
1154	2017/04/11	15:27:52	1.616	A	4.7641	V	3.205556
1155	2017/04/11	15:28:02	1.615	A	4.7577	V	3.208333
1156	2017/04/11	15:28:12	1.618	A	4.7513	V	3.211111
1157	2017/04/11	15:28:22	1.629	A	4.7647	V	3.213889
1158	2017/04/11	15:28:32	1.61	A	4.7543	V	3.216667
1159	2017/04/11	15:28:42	1.614	A	4.759	V	3.219444
1160	2017/04/11	15:28:52	1.618	A	4.7565	V	3.222222
1161	2017/04/11	15:29:02	1.586	A	4.7627	V	3.225
1162	2017/04/11	15:29:12	1.636	A	4.7543	V	3.227778
1163	2017/04/11	15:29:22	1.61	A	4.7612	V	3.230556
1164	2017/04/11	15:29:32	1.63	A	4.7563	V	3.233333
1165	2017/04/11	15:29:42	1.634	A	4.7568	V	3.236111
1166	2017/04/11	15:29:52	1.622	A	4.7617	V	3.238889
1167	2017/04/11	15:30:02	1.625	A	4.761	V	3.241667
1168	2017/04/11	15:30:12	1.616	A	4.7569	V	3.244444
1169	2017/04/11	15:30:22	1.652	A	4.7593	V	3.247222
1170	2017/04/11	15:30:32	1.596	A	4.7588	V	3.25
1171	2017/04/11	15:30:42	1.603	A	4.7575	V	3.252778
1172	2017/04/11	15:30:52	1.603	A	4.7639	V	3.255556
1173	2017/04/11	15:31:02	1.601	A	4.7603	V	3.258333
1174	2017/04/11	15:31:12	1.61	A	4.756	V	3.261111
1175	2017/04/11	15:31:22	1.584	A	4.7595	V	3.263889
1176	2017/04/11	15:31:32	1.602	A	4.7627	V	3.266667
1177	2017/04/11	15:31:42	1.599	A	4.7561	V	3.269444
1178	2017/04/11	15:31:52	1.613	A	4.763	V	3.272222
1179	2017/04/11	15:32:02	1.604	A	4.7564	V	3.275
1180	2017/04/11	15:32:12	1.631	A	4.7539	V	3.277778
1181	2017/04/11	15:32:22	1.6	A	4.7587	V	3.280556
1182	2017/04/11	15:32:32	1.586	A	4.7664	V	3.283333
1183	2017/04/11	15:32:42	1.585	A	4.7611	V	3.286111
1184	2017/04/11	15:32:52	1.574	A	4.76	V	3.288889
1185	2017/04/11	15:33:02	1.607	A	4.7581	V	3.291667
1186	2017/04/11	15:33:12	1.585	A	4.7502	V	3.294444
1187	2017/04/11	15:33:22	1.624	A	4.756	V	3.297222
1188	2017/04/11	15:33:32	1.616	A	4.7543	V	3.3
1189	2017/04/11	15:33:42	1.602	A	4.7585	V	3.302778
1190	2017/04/11	15:33:52	1.612	A	4.7575	V	3.305556
1191	2017/04/11	15:34:02	1.603	A	4.7571	V	3.308333
1192	2017/04/11	15:34:12	1.638	A	4.7568	V	3.311111
1193	2017/04/11	15:34:22	1.619	A	4.7547	V	3.313889
1194	2017/04/11	15:34:32	1.619	A	4.7597	V	3.316667
1195	2017/04/11	15:34:42	1.599	A	4.7545	V	3.319444
1196	2017/04/11	15:34:52	1.59	A	4.7513	V	3.322222
1197	2017/04/11	15:35:02	1.592	A	4.7585	V	3.325
1198	2017/04/11	15:35:12	1.605	A	4.7585	V	3.327778
1199	2017/04/11	15:35:22	1.622	A	4.7495	V	3.330556
1200	2017/04/11	15:35:32	1.639	A	4.7582	V	3.333333
1201	2017/04/11	15:35:42	1.614	A	4.7556	V	3.336111
1202	2017/04/11	15:35:52	1.63	A	4.7627	V	3.338889
1203	2017/04/11	15:36:02	1.621	A	4.7594	V	3.341667
1204	2017/04/11	15:36:12	1.617	A	4.7545	V	3.344444
1205	2017/04/11	15:36:22	1.622	A	4.7618	V	3.347222
1206	2017/04/11	15:36:32	1.647	A	4.7616	V	3.35
1207	2017/04/11	15:36:42	1.627	A	4.7532	V	3.352778
1208	2017/04/11	15:36:52	1.617	A	4.7558	V	3.355556
1209	2017/04/11	15:37:02	1.611	A	4.7558	V	3.358333
1210	2017/04/11	15:37:12	1.61	A	4.7525	V	3.361111
1211	2017/04/11	15:37:22	1.64	A	4.759	V	3.363889
1212	2017/04/11	15:37:32	1.638	A	4.7582	V	3.366667
1213	2017/04/11	15:37:42	1.645	A	4.7601	V	3.369444
1214	2017/04/11	15:37:52	1.606	A	4.7533	V	3.372222
1215	2017/04/11	15:38:02	1.623	A	4.7601	V	3.375

1216	2017/04/11	15:38:12	1.632	A	4.7534	V	3.377778
1217	2017/04/11	15:38:22	1.611	A	4.7506	V	3.380556
1218	2017/04/11	15:38:32	1.62	A	4.7568	V	3.383333
1219	2017/04/11	15:38:42	1.608	A	4.7579	V	3.386111
1220	2017/04/11	15:38:52	1.634	A	4.7623	V	3.388889
1221	2017/04/11	15:39:02	1.617	A	4.7563	V	3.391667
1222	2017/04/11	15:39:12	1.65	A	4.759	V	3.394444
1223	2017/04/11	15:39:22	1.661	A	4.7521	V	3.397222
1224	2017/04/11	15:39:32	1.638	A	4.7556	V	3.4
1225	2017/04/11	15:39:42	1.622	A	4.7596	V	3.402778
1226	2017/04/11	15:39:52	1.623	A	4.7571	V	3.405556
1227	2017/04/11	15:40:02	1.623	A	4.7591	V	3.408333
1228	2017/04/11	15:40:12	1.624	A	4.7566	V	3.411111
1229	2017/04/11	15:40:22	1.626	A	4.7601	V	3.413889
1230	2017/04/11	15:40:32	1.625	A	4.7568	V	3.416667
1231	2017/04/11	15:40:42	1.627	A	4.7587	V	3.419444
1232	2017/04/11	15:40:52	1.625	A	4.7612	V	3.422222
1233	2017/04/11	15:41:02	1.63	A	4.7571	V	3.425
1234	2017/04/11	15:41:12	1.633	A	4.7625	V	3.427778
1235	2017/04/11	15:41:22	1.604	A	4.7614	V	3.430556
1236	2017/04/11	15:41:32	1.612	A	4.7619	V	3.433333
1237	2017/04/11	15:41:42	1.633	A	4.7567	V	3.436111
1238	2017/04/11	15:41:52	1.633	A	4.7473	V	3.438889
1239	2017/04/11	15:42:02	1.595	A	4.7568	V	3.441667
1240	2017/04/11	15:42:12	1.584	A	4.7507	V	3.444444
1241	2017/04/11	15:42:22	1.618	A	4.7526	V	3.447222
1242	2017/04/11	15:42:32	1.589	A	4.7572	V	3.45
1243	2017/04/11	15:42:42	1.598	A	4.7563	V	3.452778
1244	2017/04/11	15:42:52	1.616	A	4.7599	V	3.455556
1245	2017/04/11	15:43:02	1.592	A	4.7621	V	3.458333
1246	2017/04/11	15:43:12	1.586	A	4.758	V	3.461111
1247	2017/04/11	15:43:22	1.611	A	4.757	V	3.463889
1248	2017/04/11	15:43:32	1.601	A	4.7538	V	3.466667
1249	2017/04/11	15:43:42	1.606	A	4.7551	V	3.469444
1250	2017/04/11	15:43:52	1.58	A	4.7541	V	3.472222
1251	2017/04/11	15:44:02	1.621	A	4.756	V	3.475
1252	2017/04/11	15:44:12	1.601	A	4.755	V	3.477778
1253	2017/04/11	15:44:22	1.591	A	4.7566	V	3.480556
1254	2017/04/11	15:44:32	1.593	A	4.752	V	3.483333
1255	2017/04/11	15:44:42	1.605	A	4.7533	V	3.486111
1256	2017/04/11	15:44:52	1.622	A	4.7567	V	3.488889
1257	2017/04/11	15:45:02	1.651	A	4.7655	V	3.491667
1258	2017/04/11	15:45:12	1.588	A	4.7585	V	3.494444
1259	2017/04/11	15:45:22	1.615	A	4.7466	V	3.497222
1260	2017/04/11	15:45:32	1.594	A	4.7527	V	3.5
1261	2017/04/11	15:45:42	1.616	A	4.7584	V	3.502778
1262	2017/04/11	15:45:52	1.624	A	4.7539	V	3.505556
1263	2017/04/11	15:46:02	1.627	A	4.7562	V	3.508333
1264	2017/04/11	15:46:12	1.596	A	4.7605	V	3.511111
1265	2017/04/11	15:46:22	1.58	A	4.7642	V	3.513889
1266	2017/04/11	15:46:32	1.6	A	4.7476	V	3.516667
1267	2017/04/11	15:46:42	1.61	A	4.7579	V	3.519444
1268	2017/04/11	15:46:52	1.606	A	4.7566	V	3.522222
1269	2017/04/11	15:47:02	1.645	A	4.7511	V	3.525
1270	2017/04/11	15:47:12	1.61	A	4.7591	V	3.527778
1271	2017/04/11	15:47:22	1.623	A	4.7546	V	3.530556
1272	2017/04/11	15:47:32	1.609	A	4.7556	V	3.533333
1273	2017/04/11	15:47:42	1.616	A	4.7545	V	3.536111
1274	2017/04/11	15:47:52	1.593	A	4.7576	V	3.538889
1275	2017/04/11	15:48:02	1.606	A	4.7554	V	3.541667
1276	2017/04/11	15:48:12	1.583	A	4.7567	V	3.544444
1277	2017/04/11	15:48:22	1.596	A	4.761	V	3.547222
1278	2017/04/11	15:48:32	1.615	A	4.7569	V	3.55
1279	2017/04/11	15:48:42	1.583	A	4.7621	V	3.552778
1280	2017/04/11	15:48:52	1.617	A	4.7583	V	3.555556
1281	2017/04/11	15:49:02	1.596	A	4.7561	V	3.558333
1282	2017/04/11	15:49:12	1.592	A	4.7566	V	3.561111
1283	2017/04/11	15:49:22	1.6	A	4.7572	V	3.563889
1284	2017/04/11	15:49:32	1.608	A	4.7598	V	3.566667
1285	2017/04/11	15:49:42	1.619	A	4.7558	V	3.569444
1286	2017/04/11	15:49:52	1.631	A	4.7528	V	3.572222
1287	2017/04/11	15:50:02	1.596	A	4.752	V	3.575
1288	2017/04/11	15:50:12	1.621	A	4.7571	V	3.577778
1289	2017/04/11	15:50:22	1.607	A	4.7539	V	3.580556
1290	2017/04/11	15:50:32	1.603	A	4.7578	V	3.583333
1291	2017/04/11	15:50:42	1.599	A	4.7515	V	3.586111
1292	2017/04/11	15:50:52	1.618	A	4.7493	V	3.588889
1293	2017/04/11	15:51:02	1.609	A	4.7551	V	3.591667
1294	2017/04/11	15:51:12	1.586	A	4.7547	V	3.594444
1295	2017/04/11	15:51:22	1.604	A	4.7555	V	3.597222
1296	2017/04/11	15:51:32	1.612	A	4.759	V	3.6
1297	2017/04/11	15:51:42	1.587	A	4.7537	V	3.602778
1298	2017/04/11	15:51:52	1.591	A	4.751	V	3.605556
1299	2017/04/11	15:52:02	1.603	A	4.7568	V	3.608333
1300	2017/04/11	15:52:12	1.592	A	4.7554	V	3.611111
1301	2017/04/11	15:52:22	1.566	A	4.7479	V	3.613889
1302	2017/04/11	15:52:32	1.589	A	4.7572	V	3.616667
1303	2017/04/11	15:52:42	1.567	A	4.76	V	3.619444
1304	2017/04/11	15:52:52	1.569	A	4.7571	V	3.622222
1305	2017/04/11	15:53:02	1.58	A	4.7588	V	3.625
1306	2017/04/11	15:53:12	1.598	A	4.7517	V	3.627778
1307	2017/04/11	15:53:22	1.582	A	4.7544	V	3.630556
1308	2017/04/11	15:53:32	1.585	A	4.7576	V	3.633333
1309	2017/04/11	15:53:42	1.577	A	4.7545	V	3.636111

1310	2017/04/11	15:53:52	1.557	A	4.7567	V	3.638889
1311	2017/04/11	15:54:02	1.58	A	4.7572	V	3.641667
1312	2017/04/11	15:54:12	1.57	A	4.7506	V	3.644444
1313	2017/04/11	15:54:22	1.594	A	4.7494	V	3.647222
1314	2017/04/11	15:54:32	1.596	A	4.7446	V	3.65
1315	2017/04/11	15:54:42	1.584	A	4.7524	V	3.652778
1316	2017/04/11	15:54:52	1.583	A	4.758	V	3.655556
1317	2017/04/11	15:55:02	1.645	A	4.7592	V	3.658333
1318	2017/04/11	15:55:12	1.594	A	4.7572	V	3.661111
1319	2017/04/11	15:55:22	1.573	A	4.7623	V	3.663889
1320	2017/04/11	15:55:32	1.576	A	4.7481	V	3.666667
1321	2017/04/11	15:55:42	1.598	A	4.7604	V	3.669444
1322	2017/04/11	15:55:52	1.587	A	4.7539	V	3.672222
1323	2017/04/11	15:56:02	1.608	A	4.7551	V	3.675
1324	2017/04/11	15:56:12	1.563	A	4.7574	V	3.677778
1325	2017/04/11	15:56:22	1.588	A	4.7553	V	3.680556
1326	2017/04/11	15:56:32	1.59	A	4.7561	V	3.683333
1327	2017/04/11	15:56:42	1.612	A	4.7571	V	3.686111
1328	2017/04/11	15:56:52	1.601	A	4.7521	V	3.688889
1329	2017/04/11	15:57:02	1.602	A	4.751	V	3.691667
1330	2017/04/11	15:57:12	1.568	A	4.7545	V	3.694444
1331	2017/04/11	15:57:22	1.569	A	4.7574	V	3.697222
1332	2017/04/11	15:57:32	1.622	A	4.7543	V	3.7
1333	2017/04/11	15:57:42	1.591	A	4.7512	V	3.702778
1334	2017/04/11	15:57:52	1.586	A	4.7561	V	3.705556
1335	2017/04/11	15:58:02	1.566	A	4.76	V	3.708333
1336	2017/04/11	15:58:12	1.586	A	4.7479	V	3.711111
1337	2017/04/11	15:58:22	1.607	A	4.7554	V	3.713889
1338	2017/04/11	15:58:32	1.601	A	4.7541	V	3.716667
1339	2017/04/11	15:58:42	1.602	A	4.7581	V	3.719444
1340	2017/04/11	15:58:52	1.599	A	4.7503	V	3.722222
1341	2017/04/11	15:59:02	1.583	A	4.7553	V	3.725
1342	2017/04/11	15:59:12	1.595	A	4.7567	V	3.727778
1343	2017/04/11	15:59:22	1.581	A	4.7532	V	3.730556
1344	2017/04/11	15:59:32	1.593	A	4.7495	V	3.733333
1345	2017/04/11	15:59:42	1.621	A	4.7569	V	3.736111
1346	2017/04/11	15:59:52	1.634	A	4.7536	V	3.738889
1347	2017/04/11	16:00:02	1.635	A	4.7566	V	3.741667
1348	2017/04/11	16:00:12	1.595	A	4.7591	V	3.744444
1349	2017/04/11	16:00:22	1.626	A	4.7512	V	3.747222
1350	2017/04/11	16:00:32	1.584	A	4.7549	V	3.75
1351	2017/04/11	16:00:42	1.598	A	4.7568	V	3.752778
1352	2017/04/11	16:00:52	1.614	A	4.7566	V	3.755556
1353	2017/04/11	16:01:02	1.599	A	4.7566	V	3.758333
1354	2017/04/11	16:01:12	1.602	A	4.7566	V	3.761111
1355	2017/04/11	16:01:22	1.605	A	4.7539	V	3.763889
1356	2017/04/11	16:01:32	1.593	A	4.754	V	3.766667
1357	2017/04/11	16:01:42	1.62	A	4.7562	V	3.769444
1358	2017/04/11	16:01:52	1.605	A	4.7551	V	3.772222
1359	2017/04/11	16:02:02	1.585	A	4.7545	V	3.775
1360	2017/04/11	16:02:12	1.583	A	4.7572	V	3.777778
1361	2017/04/11	16:02:22	1.652	A	4.7553	V	3.780556
1362	2017/04/11	16:02:32	1.588	A	4.7555	V	3.783333
1363	2017/04/11	16:02:42	1.583	A	4.7588	V	3.786111
1364	2017/04/11	16:02:52	1.601	A	4.758	V	3.788889
1365	2017/04/11	16:03:02	1.59	A	4.753	V	3.791667
1366	2017/04/11	16:03:12	1.59	A	4.7593	V	3.794444
1367	2017/04/11	16:03:22	1.616	A	4.758	V	3.797222
1368	2017/04/11	16:03:32	1.632	A	4.7581	V	3.8
1369	2017/04/11	16:03:42	1.617	A	4.7564	V	3.802778
1370	2017/04/11	16:03:52	1.586	A	4.7603	V	3.805556
1371	2017/04/11	16:04:02	1.587	A	4.7565	V	3.808333
1372	2017/04/11	16:04:12	1.577	A	4.7584	V	3.811111
1373	2017/04/11	16:04:22	1.591	A	4.7587	V	3.813889
1374	2017/04/11	16:04:32	1.594	A	4.7497	V	3.816667
1375	2017/04/11	16:04:42	1.585	A	4.7584	V	3.819444
1376	2017/04/11	16:04:52	1.625	A	4.7556	V	3.822222
1377	2017/04/11	16:05:02	1.636	A	4.7528	V	3.825
1378	2017/04/11	16:05:12	1.604	A	4.7603	V	3.827778
1379	2017/04/11	16:05:22	1.6	A	4.7582	V	3.830556
1380	2017/04/11	16:05:32	1.593	A	4.7578	V	3.833333
1381	2017/04/11	16:05:42	1.562	A	4.7577	V	3.836111
1382	2017/04/11	16:05:52	1.601	A	4.7538	V	3.838889
1383	2017/04/11	16:06:02	1.588	A	4.7556	V	3.841667
1384	2017/04/11	16:06:12	1.61	A	4.7593	V	3.844444
1385	2017/04/11	16:06:22	1.625	A	4.7523	V	3.847222
1386	2017/04/11	16:06:32	1.631	A	4.7584	V	3.85
1387	2017/04/11	16:06:42	1.606	A	4.7588	V	3.852778
1388	2017/04/11	16:06:52	1.607	A	4.7537	V	3.855556
1389	2017/04/11	16:07:02	1.623	A	4.7498	V	3.858333
1390	2017/04/11	16:07:12	1.627	A	4.7506	V	3.861111
1391	2017/04/11	16:07:22	1.626	A	4.761	V	3.863889
1392	2017/04/11	16:07:32	1.621	A	4.7606	V	3.866667
1393	2017/04/11	16:07:42	1.606	A	4.7549	V	3.869444
1394	2017/04/11	16:07:52	1.619	A	4.7521	V	3.872222
1395	2017/04/11	16:08:02	1.628	A	4.7567	V	3.875
1396	2017/04/11	16:08:12	1.613	A	4.7584	V	3.877778
1397	2017/04/11	16:08:22	1.634	A	4.7531	V	3.880556
1398	2017/04/11	16:08:32	1.632	A	4.7557	V	3.883333
1399	2017/04/11	16:08:42	1.586	A	4.7545	V	3.886111
1400	2017/04/11	16:08:52	1.642	A	4.7598	V	3.888889
1401	2017/04/11	16:09:02	1.605	A	4.7526	V	3.891667
1402	2017/04/11	16:09:12	1.581	A	4.753	V	3.894444
1403	2017/04/11	16:09:22	1.588	A	4.7528	V	3.897222

1404	2017/04/11	16:09:32	1.611	A	4.7506	V	3.9
1405	2017/04/11	16:09:42	1.58	A	4.7536	V	3.902778
1406	2017/04/11	16:09:52	1.592	A	4.7524	V	3.905556
1407	2017/04/11	16:10:02	1.59	A	4.7526	V	3.908333
1408	2017/04/11	16:10:12	1.595	A	4.7607	V	3.911111
1409	2017/04/11	16:10:22	1.602	A	4.7541	V	3.913889
1410	2017/04/11	16:10:32	1.632	A	4.7607	V	3.916667
1411	2017/04/11	16:10:42	1.62	A	4.7563	V	3.919444
1412	2017/04/11	16:10:52	1.612	A	4.7549	V	3.922222
1413	2017/04/11	16:11:02	1.614	A	4.7551	V	3.925
1414	2017/04/11	16:11:12	1.615	A	4.763	V	3.927778
1415	2017/04/11	16:11:22	1.609	A	4.7552	V	3.930556
1416	2017/04/11	16:11:32	1.612	A	4.7517	V	3.933333
1417	2017/04/11	16:11:42	1.608	A	4.7499	V	3.936111
1418	2017/04/11	16:11:52	1.612	A	4.7536	V	3.938889
1419	2017/04/11	16:12:02	1.604	A	4.7583	V	3.941667
1420	2017/04/11	16:12:12	1.621	A	4.7585	V	3.944444
1421	2017/04/11	16:12:22	1.607	A	4.7542	V	3.947222
1422	2017/04/11	16:12:32	1.598	A	4.7598	V	3.95
1423	2017/04/11	16:12:42	1.606	A	4.7535	V	3.952778
1424	2017/04/11	16:12:52	1.593	A	4.7587	V	3.955556
1425	2017/04/11	16:13:02	1.596	A	4.7542	V	3.958333
1426	2017/04/11	16:13:12	1.624	A	4.7494	V	3.961111
1427	2017/04/11	16:13:22	1.598	A	4.7617	V	3.963889
1428	2017/04/11	16:13:32	1.635	A	4.7519	V	3.966667
1429	2017/04/11	16:13:42	1.584	A	4.76	V	3.969444
1430	2017/04/11	16:13:52	1.598	A	4.7572	V	3.972222
1431	2017/04/11	16:14:02	1.612	A	4.7595	V	3.975
1432	2017/04/11	16:14:12	1.594	A	4.7594	V	3.977778
1433	2017/04/11	16:14:22	1.612	A	4.7551	V	3.980556
1434	2017/04/11	16:14:32	1.64	A	4.7585	V	3.983333
1435	2017/04/11	16:14:42	1.587	A	4.756	V	3.986111
1436	2017/04/11	16:14:52	1.613	A	4.7587	V	3.988889
1437	2017/04/11	16:15:02	1.587	A	4.7582	V	3.991667
1438	2017/04/11	16:15:12	1.592	A	4.7579	V	3.994444
1439	2017/04/11	16:15:22	1.602	A	4.7594	V	3.997222
1440	2017/04/11	16:15:32	1.63	A	4.752	V	4
1441	2017/04/11	16:15:42	1.601	A	4.7551	V	4.002778
1442	2017/04/11	16:15:52	1.603	A	4.7526	V	4.005556
1443	2017/04/11	16:16:02	1.605	A	4.7533	V	4.008333
1444	2017/04/11	16:16:12	1.626	A	4.7566	V	4.011111
1445	2017/04/11	16:16:22	1.582	A	4.7543	V	4.013889
1446	2017/04/11	16:16:32	1.62	A	4.7555	V	4.016667
1447	2017/04/11	16:16:42	1.61	A	4.7602	V	4.019444
1448	2017/04/11	16:16:52	1.607	A	4.7553	V	4.022222
1449	2017/04/11	16:17:02	1.631	A	4.7618	V	4.025
1450	2017/04/11	16:17:12	1.611	A	4.7577	V	4.027778
1451	2017/04/11	16:17:22	1.634	A	4.7596	V	4.030556
1452	2017/04/11	16:17:32	1.595	A	4.7522	V	4.033333
1453	2017/04/11	16:17:42	1.631	A	4.7607	V	4.036111
1454	2017/04/11	16:17:52	1.628	A	4.7543	V	4.038889
1455	2017/04/11	16:18:02	1.608	A	4.7575	V	4.041667
1456	2017/04/11	16:18:12	1.642	A	4.7544	V	4.044444
1457	2017/04/11	16:18:22	1.631	A	4.7581	V	4.047222
1458	2017/04/11	16:18:32	1.603	A	4.7583	V	4.05
1459	2017/04/11	16:18:42	1.635	A	4.7614	V	4.052778
1460	2017/04/11	16:18:52	1.623	A	4.7539	V	4.055556
1461	2017/04/11	16:19:02	1.664	A	4.7525	V	4.058333
1462	2017/04/11	16:19:12	1.606	A	4.7529	V	4.061111
1463	2017/04/11	16:19:22	1.616	A	4.7571	V	4.063889
1464	2017/04/11	16:19:32	1.608	A	4.7551	V	4.066667
1465	2017/04/11	16:19:42	1.629	A	4.7487	V	4.069444
1466	2017/04/11	16:19:52	1.617	A	4.7535	V	4.072222
1467	2017/04/11	16:20:02	1.617	A	4.7493	V	4.075
1468	2017/04/11	16:20:12	1.613	A	4.7552	V	4.077778
1469	2017/04/11	16:20:22	1.634	A	4.7599	V	4.080556
1470	2017/04/11	16:20:32	1.609	A	4.7521	V	4.083333
1471	2017/04/11	16:20:42	1.623	A	4.7544	V	4.086111
1472	2017/04/11	16:20:52	1.616	A	4.7547	V	4.088889
1473	2017/04/11	16:21:02	1.6	A	4.7559	V	4.091667
1474	2017/04/11	16:21:12	1.593	A	4.7601	V	4.094444
1475	2017/04/11	16:21:22	1.586	A	4.7541	V	4.097222
1476	2017/04/11	16:21:32	1.617	A	4.7532	V	4.1
1477	2017/04/11	16:21:42	1.632	A	4.7546	V	4.102778
1478	2017/04/11	16:21:52	1.623	A	4.759	V	4.105556
1479	2017/04/11	16:22:02	1.605	A	4.757	V	4.108333
1480	2017/04/11	16:22:12	1.598	A	4.7527	V	4.111111
1481	2017/04/11	16:22:22	1.613	A	4.7602	V	4.113889
1482	2017/04/11	16:22:32	1.615	A	4.7519	V	4.116667
1483	2017/04/11	16:22:42	1.578	A	4.7527	V	4.119444
1484	2017/04/11	16:22:52	1.614	A	4.7573	V	4.122222
1485	2017/04/11	16:23:02	1.616	A	4.7577	V	4.125
1486	2017/04/11	16:23:12	1.582	A	4.756	V	4.127778
1487	2017/04/11	16:23:22	1.597	A	4.754	V	4.130556
1488	2017/04/11	16:23:32	1.6	A	4.7574	V	4.133333
1489	2017/04/11	16:23:42	1.591	A	4.7605	V	4.136111
1490	2017/04/11	16:23:52	1.619	A	4.7612	V	4.138889
1491	2017/04/11	16:24:02	1.599	A	4.7554	V	4.141667
1492	2017/04/11	16:24:12	1.622	A	4.7615	V	4.144444
1493	2017/04/11	16:24:22	1.613	A	4.7539	V	4.147222
1494	2017/04/11	16:24:32	1.565	A	4.7508	V	4.15
1495	2017/04/11	16:24:42	1.67	A	4.7578	V	4.152778
1496	2017/04/11	16:24:52	1.622	A	4.7611	V	4.155556
1497	2017/04/11	16:25:02	1.666	A	4.7621	V	4.158333

1498	2017/04/11	16:25:12	1.687 A	4.7639 V	4.161111
1499	2017/04/11	16:25:22	1.657 A	4.7673 V	4.163889
1500	2017/04/11	16:25:32	1.674 A	4.7687 V	4.166667
1501	2017/04/11	16:25:42	1.649 A	4.7671 V	4.169444
1502	2017/04/11	16:25:52	1.67 A	4.763 V	4.172222
1503	2017/04/11	16:26:02	1.652 A	4.769 V	4.175
1504	2017/04/11	16:26:12	1.689 A	4.7605 V	4.177778
1505	2017/04/11	16:26:22	1.677 A	4.7684 V	4.180556
1506	2017/04/11	16:26:32	1.687 A	4.7689 V	4.183333
1507	2017/04/11	16:26:42	1.673 A	4.764 V	4.186111
1508	2017/04/11	16:26:52	1.665 A	4.7647 V	4.188889
1509	2017/04/11	16:27:02	1.69 A	4.7601 V	4.191667
1510	2017/04/11	16:27:12	1.684 A	4.7613 V	4.194444
1511	2017/04/11	16:27:22	1.679 A	4.762 V	4.197222
1512	2017/04/11	16:27:32	1.685 A	4.7698 V	4.2
1513	2017/04/11	16:27:42	1.671 A	4.7574 V	4.202778
1514	2017/04/11	16:27:52	1.693 A	4.7671 V	4.205556
1515	2017/04/11	16:28:02	1.699 A	4.7678 V	4.208333
1516	2017/04/11	16:28:12	1.653 A	4.7661 V	4.211111
1517	2017/04/11	16:28:22	1.679 A	4.7665 V	4.213889
1518	2017/04/11	16:28:32	1.662 A	4.7694 V	4.216667
1519	2017/04/11	16:28:42	1.665 A	4.7669 V	4.219444
1520	2017/04/11	16:28:52	1.677 A	4.7604 V	4.222222
1521	2017/04/11	16:29:02	1.665 A	4.7638 V	4.225
1522	2017/04/11	16:29:12	1.692 A	4.7675 V	4.227778
1523	2017/04/11	16:29:22	1.725 A	4.7667 V	4.230556
1524	2017/04/11	16:29:32	1.671 A	4.7632 V	4.233333
1525	2017/04/11	16:29:42	1.702 A	4.7677 V	4.236111
1526	2017/04/11	16:29:52	1.711 A	4.7629 V	4.238889
1527	2017/04/11	16:30:02	1.692 A	4.7669 V	4.241667
1528	2017/04/11	16:30:12	1.697 A	4.7672 V	4.244444
1529	2017/04/11	16:30:22	1.672 A	4.7667 V	4.247222
1530	2017/04/11	16:30:32	1.735 A	4.7675 V	4.25
1531	2017/04/11	16:30:42	1.682 A	4.7721 V	4.252778
1532	2017/04/11	16:30:52	1.677 A	4.7677 V	4.255556
1533	2017/04/11	16:31:02	1.7 A	4.7673 V	4.258333
1534	2017/04/11	16:31:12	1.715 A	4.7615 V	4.261111
1535	2017/04/11	16:31:22	1.729 A	4.7647 V	4.263889
1536	2017/04/11	16:31:32	1.722 A	4.7704 V	4.266667
1537	2017/04/11	16:31:42	1.681 A	4.7667 V	4.269444
1538	2017/04/11	16:31:52	1.664 A	4.7589 V	4.272222
1539	2017/04/11	16:32:02	1.691 A	4.7693 V	4.275
1540	2017/04/11	16:32:12	1.652 A	4.7646 V	4.277778
1541	2017/04/11	16:32:22	1.658 A	4.7646 V	4.280556
1542	2017/04/11	16:32:32	1.69 A	4.769 V	4.283333
1543	2017/04/11	16:32:42	1.691 A	4.7584 V	4.286111
1544	2017/04/11	16:32:52	1.713 A	4.7716 V	4.288889
1545	2017/04/11	16:33:02	1.676 A	4.7694 V	4.291667
1546	2017/04/11	16:33:12	1.713 A	4.765 V	4.294444
1547	2017/04/11	16:33:22	1.655 A	4.7572 V	4.297222
1548	2017/04/11	16:33:32	1.698 A	4.7647 V	4.3
1549	2017/04/11	16:33:42	1.679 A	4.7647 V	4.302778
1550	2017/04/11	16:33:52	1.684 A	4.7719 V	4.305556
1551	2017/04/11	16:34:02	1.679 A	4.7695 V	4.308333
1552	2017/04/11	16:34:12	1.704 A	4.7651 V	4.311111
1553	2017/04/11	16:34:22	1.672 A	4.7649 V	4.313889
1554	2017/04/11	16:34:32	1.681 A	4.7688 V	4.316667
1555	2017/04/11	16:34:42	1.669 A	4.7602 V	4.319444
1556	2017/04/11	16:34:52	1.706 A	4.7658 V	4.322222
1557	2017/04/11	16:35:02	1.686 A	4.7659 V	4.325
1558	2017/04/11	16:35:12	1.689 A	4.7697 V	4.327778
1559	2017/04/11	16:35:22	1.701 A	4.7664 V	4.330556
1560	2017/04/11	16:35:32	1.68 A	4.7647 V	4.333333
1561	2017/04/11	16:35:42	1.694 A	4.7719 V	4.336111
1562	2017/04/11	16:35:52	1.683 A	4.7681 V	4.338889
1563	2017/04/11	16:36:02	1.681 A	4.7697 V	4.341667
1564	2017/04/11	16:36:12	1.684 A	4.7702 V	4.344444
1565	2017/04/11	16:36:22	1.706 A	4.7668 V	4.347222
1566	2017/04/11	16:36:32	1.685 A	4.769 V	4.35
1567	2017/04/11	16:36:42	1.69 A	4.765 V	4.352778
1568	2017/04/11	16:36:52	1.693 A	4.7678 V	4.355556
1569	2017/04/11	16:37:02	1.66 A	4.7676 V	4.358333
1570	2017/04/11	16:37:12	1.665 A	4.767 V	4.361111
1571	2017/04/11	16:37:22	1.68 A	4.7671 V	4.363889
1572	2017/04/11	16:37:32	1.677 A	4.7672 V	4.366667
1573	2017/04/11	16:37:42	1.647 A	4.7665 V	4.369444
1574	2017/04/11	16:37:52	1.665 A	4.771 V	4.372222
1575	2017/04/11	16:38:02	1.681 A	4.7652 V	4.375
1576	2017/04/11	16:38:12	1.652 A	4.7686 V	4.377778
1577	2017/04/11	16:38:22	1.668 A	4.7702 V	4.380556
1578	2017/04/11	16:38:32	1.662 A	4.7701 V	4.383333
1579	2017/04/11	16:38:42	1.686 A	4.766 V	4.386111
1580	2017/04/11	16:38:52	1.674 A	4.7669 V	4.388889
1581	2017/04/11	16:39:02	1.656 A	4.7648 V	4.391667
1582	2017/04/11	16:39:12	1.641 A	4.7708 V	4.394444
1583	2017/04/11	16:39:22	1.641 A	4.7725 V	4.397222
1584	2017/04/11	16:39:32	1.648 A	4.7657 V	4.4
1585	2017/04/11	16:39:42	1.625 A	4.7765 V	4.402778
1586	2017/04/11	16:39:52	1.692 A	4.7764 V	4.405556
1587	2017/04/11	16:40:02	1.603 A	4.7766 V	4.408333
1588	2017/04/11	16:40:12	1.655 A	4.7619 V	4.411111
1589	2017/04/11	16:40:22	1.622 A	4.7765 V	4.413889
1590	2017/04/11	16:40:32	1.621 A	4.7817 V	4.416667
1591	2017/04/11	16:40:42	1.62 A	4.777 V	4.419444

1592	2017/04/11	16:40:52	1.632	A	4.7771	V	4.422222
1593	2017/04/11	16:41:02	1.616	A	4.777	V	4.425
1594	2017/04/11	16:41:12	1.617	A	4.7773	V	4.427778
1595	2017/04/11	16:41:22	1.613	A	4.7779	V	4.430556
1596	2017/04/11	16:41:32	1.613	A	4.7778	V	4.433333
1597	2017/04/11	16:41:42	1.612	A	4.7841	V	4.436111
1598	2017/04/11	16:41:52	1.598	A	4.7781	V	4.438889
1599	2017/04/11	16:42:02	1.609	A	4.7783	V	4.441667
1600	2017/04/11	16:42:12	1.608	A	4.7778	V	4.444444
1601	2017/04/11	16:42:22	1.531	A	4.7786	V	4.447222
1602	2017/04/11	16:42:32	1.606	A	4.7784	V	4.45
1603	2017/04/11	16:42:42	1.606	A	4.7788	V	4.452778
1604	2017/04/11	16:42:52	1.528	A	4.7896	V	4.455556
1605	2017/04/11	16:43:02	1.576	A	4.7891	V	4.458333
1606	2017/04/11	16:43:12	1.518	A	4.778	V	4.461111
1607	2017/04/11	16:43:22	1.594	A	4.7882	V	4.463889
1608	2017/04/11	16:43:32	1.519	A	4.7883	V	4.466667
1609	2017/04/11	16:43:42	1.519	A	4.788	V	4.469444
1610	2017/04/11	16:43:52	1.515	A	4.788	V	4.472222
1611	2017/04/11	16:44:02	1.517	A	4.7881	V	4.475
1612	2017/04/11	16:44:12	1.516	A	4.7881	V	4.477778
1613	2017/04/11	16:44:22	1.516	A	4.7879	V	4.480556
1614	2017/04/11	16:44:32	1.513	A	4.7879	V	4.483333
1615	2017/04/11	16:44:42	1.514	A	4.788	V	4.486111
1616	2017/04/11	16:44:52	1.511	A	4.7882	V	4.488889
1617	2017/04/11	16:45:02	1.512	A	4.7884	V	4.491667
1618	2017/04/11	16:45:12	1.511	A	4.7884	V	4.494444
1619	2017/04/11	16:45:22	1.509	A	4.7886	V	4.497222
1620	2017/04/11	16:45:32	1.509	A	4.7888	V	4.5
1621	2017/04/11	16:45:42	1.507	A	4.7891	V	4.502778
1622	2017/04/11	16:45:52	1.507	A	4.7891	V	4.505556
1623	2017/04/11	16:46:02	1.507	A	4.7892	V	4.508333
1624	2017/04/11	16:46:12	1.506	A	4.7895	V	4.511111
1625	2017/04/11	16:46:22	1.502	A	4.7896	V	4.513889
1626	2017/04/11	16:46:32	1.501	A	4.7898	V	4.516667
1627	2017/04/11	16:46:42	1.5	A	4.79	V	4.519444
1628	2017/04/11	16:46:52	1.499	A	4.7902	V	4.522222
1629	2017/04/11	16:47:02	1.501	A	4.7903	V	4.525
1630	2017/04/11	16:47:12	1.497	A	4.7903	V	4.527778
1631	2017/04/11	16:47:22	1.494	A	4.7901	V	4.530556
1632	2017/04/11	16:47:32	1.493	A	4.79	V	4.533333
1633	2017/04/11	16:47:42	1.493	A	4.7904	V	4.536111
1634	2017/04/11	16:47:52	1.491	A	4.7906	V	4.538889
1635	2017/04/11	16:48:02	1.491	A	4.7906	V	4.541667
1636	2017/04/11	16:48:12	1.488	A	4.7907	V	4.544444
1637	2017/04/11	16:48:22	1.488	A	4.7908	V	4.547222
1638	2017/04/11	16:48:32	1.488	A	4.791	V	4.55
1639	2017/04/11	16:48:42	1.486	A	4.7913	V	4.552778
1640	2017/04/11	16:48:52	1.486	A	4.7913	V	4.555556
1641	2017/04/11	16:49:02	1.483	A	4.7913	V	4.558333
1642	2017/04/11	16:49:12	1.485	A	4.7916	V	4.561111
1643	2017/04/11	16:49:22	1.483	A	4.7919	V	4.563889
1644	2017/04/11	16:49:32	1.481	A	4.7919	V	4.566667
1645	2017/04/11	16:49:42	1.479	A	4.7919	V	4.569444
1646	2017/04/11	16:49:52	1.48	A	4.7921	V	4.572222
1647	2017/04/11	16:50:02	1.478	A	4.7921	V	4.575
1648	2017/04/11	16:50:12	1.477	A	4.7925	V	4.577778
1649	2017/04/11	16:50:22	1.475	A	4.7924	V	4.580556
1650	2017/04/11	16:50:32	1.473	A	4.7926	V	4.583333
1651	2017/04/11	16:50:42	1.472	A	4.7927	V	4.586111
1652	2017/04/11	16:50:52	1.471	A	4.7928	V	4.588889
1653	2017/04/11	16:51:02	1.471	A	4.7929	V	4.591667
1654	2017/04/11	16:51:12	1.469	A	4.793	V	4.594444
1655	2017/04/11	16:51:22	1.466	A	4.7932	V	4.597222
1656	2017/04/11	16:51:32	1.465	A	4.7937	V	4.6
1657	2017/04/11	16:51:42	1.464	A	4.7925	V	4.602778
1658	2017/04/11	16:51:52	1.464	A	4.7934	V	4.605556
1659	2017/04/11	16:52:02	1.464	A	4.7934	V	4.608333
1660	2017/04/11	16:52:12	1.464	A	4.7939	V	4.611111
1661	2017/04/11	16:52:22	1.459	A	4.7943	V	4.613889
1662	2017/04/11	16:52:32	1.461	A	4.7933	V	4.616667
1663	2017/04/11	16:52:42	1.456	A	4.794	V	4.619444
1664	2017/04/11	16:52:52	1.457	A	4.7937	V	4.622222
1665	2017/04/11	16:53:02	1.459	A	4.7941	V	4.625
1666	2017/04/11	16:53:12	1.452	A	4.7939	V	4.627778
1667	2017/04/11	16:53:22	1.453	A	4.7943	V	4.630556
1668	2017/04/11	16:53:32	1.453	A	4.7945	V	4.633333
1669	2017/04/11	16:53:42	1.451	A	4.7944	V	4.636111
1670	2017/04/11	16:53:52	1.45	A	4.7951	V	4.638889
1671	2017/04/11	16:54:02	1.447	A	4.796	V	4.641667
1672	2017/04/11	16:54:12	1.448	A	4.795	V	4.644444
1673	2017/04/11	16:54:22	1.447	A	4.7945	V	4.647222
1674	2017/04/11	16:54:32	1.447	A	4.7958	V	4.65
1675	2017/04/11	16:54:42	1.444	A	4.7958	V	4.652778
1676	2017/04/11	16:54:52	1.446	A	4.7947	V	4.655556
1677	2017/04/11	16:55:02	1.444	A	4.7973	V	4.658333
1678	2017/04/11	16:55:12	1.445	A	4.797	V	4.661111
1679	2017/04/11	16:55:22	1.442	A	4.797	V	4.663889
1680	2017/04/11	16:55:32	1.442	A	4.7977	V	4.666667
1681	2017/04/11	16:55:42	1.438	A	4.7977	V	4.669444
1682	2017/04/11	16:55:52	1.44	A	4.7977	V	4.672222
1683	2017/04/11	16:56:02	1.437	A	4.7973	V	4.675
1684	2017/04/11	16:56:12	1.436	A	4.7979	V	4.677778
1685	2017/04/11	16:56:22	1.435	A	4.7982	V	4.680556

3rd Green Light on, 4th Green Light Flashing.

1686	2017/04/11	16:56:32	1.433	A	4.7979	V	4.683333
1687	2017/04/11	16:56:42	1.435	A	4.7983	V	4.686111
1688	2017/04/11	16:56:52	1.433	A	4.7988	V	4.688889
1689	2017/04/11	16:57:02	1.433	A	4.7987	V	4.691667
1690	2017/04/11	16:57:12	1.43	A	4.7989	V	4.694444
1691	2017/04/11	16:57:22	1.429	A	4.7989	V	4.697222
1692	2017/04/11	16:57:32	1.428	A	4.7992	V	4.7
1693	2017/04/11	16:57:42	1.429	A	4.7996	V	4.702778
1694	2017/04/11	16:57:52	1.428	A	4.7999	V	4.705556
1695	2017/04/11	16:58:02	1.427	A	4.7999	V	4.708333
1696	2017/04/11	16:58:12	1.427	A	4.8003	V	4.711111
1697	2017/04/11	16:58:22	1.424	A	4.8004	V	4.713889
1698	2017/04/11	16:58:32	1.423	A	4.8006	V	4.716667
1699	2017/04/11	16:58:42	1.423	A	4.801	V	4.719444
1700	2017/04/11	16:58:52	1.421	A	4.8012	V	4.722222
1701	2017/04/11	16:59:02	1.422	A	4.8013	V	4.725
1702	2017/04/11	16:59:12	1.419	A	4.8014	V	4.727778
1703	2017/04/11	16:59:22	1.419	A	4.8018	V	4.730556
1704	2017/04/11	16:59:32	1.417	A	4.8021	V	4.733333
1705	2017/04/11	16:59:42	1.418	A	4.802	V	4.736111
1706	2017/04/11	16:59:52	1.416	A	4.8022	V	4.738889
1707	2017/04/11	17:00:02	1.416	A	4.8026	V	4.741667
1708	2017/04/11	17:00:12	1.415	A	4.8029	V	4.744444
1709	2017/04/11	17:00:22	1.414	A	4.8031	V	4.747222
1710	2017/04/11	17:00:32	1.414	A	4.8032	V	4.75
1711	2017/04/11	17:00:42	1.412	A	4.8035	V	4.752778
1712	2017/04/11	17:00:52	1.412	A	4.8036	V	4.755556
1713	2017/04/11	17:01:02	1.409	A	4.8037	V	4.758333
1714	2017/04/11	17:01:12	1.408	A	4.8039	V	4.761111
1715	2017/04/11	17:01:22	1.409	A	4.8041	V	4.763889
1716	2017/04/11	17:01:32	1.409	A	4.8043	V	4.766667
1717	2017/04/11	17:01:42	1.407	A	4.8045	V	4.769444
1718	2017/04/11	17:01:52	1.406	A	4.8048	V	4.772222
1719	2017/04/11	17:02:02	1.404	A	4.8049	V	4.775
1720	2017/04/11	17:02:12	1.404	A	4.8051	V	4.777778
1721	2017/04/11	17:02:22	1.404	A	4.8053	V	4.780556
1722	2017/04/11	17:02:32	1.401	A	4.8055	V	4.783333
1723	2017/04/11	17:02:42	1.401	A	4.8056	V	4.786111
1724	2017/04/11	17:02:52	1.398	A	4.8056	V	4.788889
1725	2017/04/11	17:03:02	1.398	A	4.8058	V	4.791667
1726	2017/04/11	17:03:12	1.396	A	4.806	V	4.794444
1727	2017/04/11	17:03:22	1.395	A	4.8063	V	4.797222
1728	2017/04/11	17:03:32	1.394	A	4.8065	V	4.8
1729	2017/04/11	17:03:42	1.168	A	4.8067	V	4.802778
1730	2017/04/11	17:03:52	1.17	A	4.8416	V	4.805556
1731	2017/04/11	17:04:02	1.17	A	4.8413	V	4.808333
1732	2017/04/11	17:04:12	1.171	A	4.841	V	4.811111
1733	2017/04/11	17:04:22	1.168	A	4.841	V	4.813889
1734	2017/04/11	17:04:32	1.168	A	4.841	V	4.816667
1735	2017/04/11	17:04:42	1.168	A	4.841	V	4.819444
1736	2017/04/11	17:04:52	1.169	A	4.8411	V	4.822222
1737	2017/04/11	17:05:02	1.167	A	4.8411	V	4.825
1738	2017/04/11	17:05:12	1.168	A	4.8411	V	4.827778
1739	2017/04/11	17:05:22	1.166	A	4.8413	V	4.830556
1740	2017/04/11	17:05:32	1.166	A	4.8414	V	4.833333
1741	2017/04/11	17:05:42	1.167	A	4.8414	V	4.836111
1742	2017/04/11	17:05:52	1.165	A	4.8414	V	4.838889
1743	2017/04/11	17:06:02	1.164	A	4.8415	V	4.841667
1744	2017/04/11	17:06:12	1.161	A	4.8416	V	4.844444
1745	2017/04/11	17:06:22	1.162	A	4.8418	V	4.847222
1746	2017/04/11	17:06:32	1.162	A	4.8418	V	4.85
1747	2017/04/11	17:06:42	1.161	A	4.842	V	4.852778
1748	2017/04/11	17:06:52	1.16	A	4.842	V	4.855556
1749	2017/04/11	17:07:02	1.159	A	4.8422	V	4.858333
1750	2017/04/11	17:07:12	1.159	A	4.8424	V	4.861111
1751	2017/04/11	17:07:22	1.158	A	4.8426	V	4.863889
1752	2017/04/11	17:07:32	1.158	A	4.843	V	4.866667
1753	2017/04/11	17:07:42	1.158	A	4.8433	V	4.869444
1754	2017/04/11	17:07:52	1.156	A	4.8433	V	4.872222
1755	2017/04/11	17:08:02	1.155	A	4.8433	V	4.875
1756	2017/04/11	17:08:12	1.155	A	4.8437	V	4.877778
1757	2017/04/11	17:08:22	1.154	A	4.8439	V	4.880556
1758	2017/04/11	17:08:32	1.153	A	4.8441	V	4.883333
1759	2017/04/11	17:08:42	1.154	A	4.8444	V	4.886111
1760	2017/04/11	17:08:52	1.153	A	4.8444	V	4.888889
1761	2017/04/11	17:09:02	1.152	A	4.8446	V	4.891667
1762	2017/04/11	17:09:12	1.15	A	4.8446	V	4.894444
1763	2017/04/11	17:09:22	1.15	A	4.8446	V	4.897222
1764	2017/04/11	17:09:32	1.151	A	4.8447	V	4.9
1765	2017/04/11	17:09:42	1.073	A	4.8451	V	4.902778
1766	2017/04/11	17:09:52	1.068	A	4.8564	V	4.905556
1767	2017/04/11	17:10:02	1.066	A	4.856	V	4.908333
1768	2017/04/11	17:10:12	1.068	A	4.8563	V	4.911111
1769	2017/04/11	17:10:22	1.07	A	4.856	V	4.913889
1770	2017/04/11	17:10:32	1.068	A	4.8562	V	4.916667
1771	2017/04/11	17:10:42	0.989	A	4.8562	V	4.919444
1772	2017/04/11	17:10:52	0.99	A	4.8678	V	4.922222
1773	2017/04/11	17:11:02	0.987	A	4.8682	V	4.925
1774	2017/04/11	17:11:12	0.988	A	4.8683	V	4.927778
1775	2017/04/11	17:11:22	0.99	A	4.8688	V	4.930556
1776	2017/04/11	17:11:32	0.978	A	4.8681	V	4.933333
1777	2017/04/11	17:11:42	0.98	A	4.8664	V	4.936111
1778	2017/04/11	17:11:52	0.979	A	4.8655	V	4.938889
1779	2017/04/11	17:12:02	0.977	A	4.8665	V	4.941667

1780	2017/04/11	17:12:12	0.979	A	4.8665	V	4.944444
1781	2017/04/11	17:12:22	0.978	A	4.8672	V	4.947222
1782	2017/04/11	17:12:32	0.975	A	4.8663	V	4.95
1783	2017/04/11	17:12:42	0.976	A	4.8663	V	4.952778
1784	2017/04/11	17:12:52	0.976	A	4.8667	V	4.955556
1785	2017/04/11	17:13:02	0.975	A	4.8665	V	4.958333
1786	2017/04/11	17:13:12	0.977	A	4.8667	V	4.961111
1787	2017/04/11	17:13:22	0.976	A	4.8669	V	4.963889
1788	2017/04/11	17:13:32	0.906	A	4.8822	V	4.966667
1789	2017/04/11	17:13:42	0.908	A	4.882	V	4.969444
1790	2017/04/11	17:13:52	0.906	A	4.882	V	4.972222
1791	2017/04/11	17:14:02	0.907	A	4.8821	V	4.975
1792	2017/04/11	17:14:12	0.907	A	4.8821	V	4.977778
1793	2017/04/11	17:14:22	0.902	A	4.8819	V	4.980556
1794	2017/04/11	17:14:32	0.902	A	4.8815	V	4.983333
1795	2017/04/11	17:14:42	0.903	A	4.8816	V	4.986111
1796	2017/04/11	17:14:52	0.902	A	4.8816	V	4.988889
1797	2017/04/11	17:15:02	0.903	A	4.8819	V	4.991667
1798	2017/04/11	17:15:12	0.901	A	4.8821	V	4.994444
1799	2017/04/11	17:15:22	0.9	A	4.8821	V	4.997222
1800	2017/04/11	17:15:32	0.9	A	4.8824	V	5
1801	2017/04/11	17:15:42	0.898	A	4.8822	V	5.002778
1802	2017/04/11	17:15:52	0.9	A	4.8824	V	5.005556
1803	2017/04/11	17:16:02	0.899	A	4.8826	V	5.008333
1804	2017/04/11	17:16:12	0.899	A	4.8827	V	5.011111
1805	2017/04/11	17:16:22	0.896	A	4.8829	V	5.013889
1806	2017/04/11	17:16:32	0.896	A	4.8831	V	5.016667
1807	2017/04/11	17:16:42	0.897	A	4.8832	V	5.019444
1808	2017/04/11	17:16:52	0.897	A	4.8832	V	5.022222
1809	2017/04/11	17:17:02	0.897	A	4.8834	V	5.025
1810	2017/04/11	17:17:12	0.895	A	4.8835	V	5.027778
1811	2017/04/11	17:17:22	0.895	A	4.8835	V	5.030556
1812	2017/04/11	17:17:32	0.895	A	4.8837	V	5.033333
1813	2017/04/11	17:17:42	0.894	A	4.8837	V	5.036111
1814	2017/04/11	17:17:52	0.895	A	4.8839	V	5.038889
1815	2017/04/11	17:18:02	0.893	A	4.8841	V	5.041667
1816	2017/04/11	17:18:12	0.894	A	4.8843	V	5.044444
1817	2017/04/11	17:18:22	0.892	A	4.8845	V	5.047222
1818	2017/04/11	17:18:32	0.891	A	4.8847	V	5.05
1819	2017/04/11	17:18:42	0.89	A	4.8847	V	5.052778
1820	2017/04/11	17:18:52	0.89	A	4.8848	V	5.055556
1821	2017/04/11	17:19:02	0.891	A	4.8849	V	5.058333
1822	2017/04/11	17:19:12	0.891	A	4.8851	V	5.061111
1823	2017/04/11	17:19:22	0.89	A	4.8853	V	5.063889
1824	2017/04/11	17:19:32	0.888	A	4.8852	V	5.066667
1825	2017/04/11	17:19:42	0.888	A	4.8853	V	5.069444
1826	2017/04/11	17:19:52	0.888	A	4.8855	V	5.072222
1827	2017/04/11	17:20:02	0.888	A	4.8858	V	5.075
1828	2017/04/11	17:20:12	0.885	A	4.8858	V	5.077778
1829	2017/04/11	17:20:22	0.885	A	4.886	V	5.080556
1830	2017/04/11	17:20:32	0.885	A	4.8863	V	5.083333
1831	2017/04/11	17:20:42	0.801	A	4.8865	V	5.086111
1832	2017/04/11	17:20:52	0.801	A	4.8962	V	5.088889
1833	2017/04/11	17:21:02	0.8	A	4.8962	V	5.091667
1834	2017/04/11	17:21:12	0.8	A	4.8962	V	5.094444
1835	2017/04/11	17:21:22	0.798	A	4.8961	V	5.097222
1836	2017/04/11	17:21:32	0.799	A	4.8962	V	5.1
1837	2017/04/11	17:21:42	0.799	A	4.8962	V	5.102778
1838	2017/04/11	17:21:52	0.798	A	4.8963	V	5.105556
1839	2017/04/11	17:22:02	0.798	A	4.8963	V	5.108333
1840	2017/04/11	17:22:12	0.798	A	4.8962	V	5.111111
1841	2017/04/11	17:22:22	0.797	A	4.8961	V	5.113889
1842	2017/04/11	17:22:32	0.795	A	4.8963	V	5.116667
1843	2017/04/11	17:22:42	0.795	A	4.8962	V	5.119444
1844	2017/04/11	17:22:52	0.795	A	4.8964	V	5.122222
1845	2017/04/11	17:23:02	0.796	A	4.8966	V	5.125
1846	2017/04/11	17:23:12	0.795	A	4.8967	V	5.127778
1847	2017/04/11	17:23:22	0.795	A	4.8971	V	5.130556
1848	2017/04/11	17:23:32	0.794	A	4.8972	V	5.133333
1849	2017/04/11	17:23:42	0.794	A	4.8971	V	5.136111
1850	2017/04/11	17:23:52	0.793	A	4.8971	V	5.138889
1851	2017/04/11	17:24:02	0.792	A	4.8972	V	5.141667
1852	2017/04/11	17:24:12	0.792	A	4.8973	V	5.144444
1853	2017/04/11	17:24:22	0.792	A	4.8974	V	5.147222
1854	2017/04/11	17:24:32	0.79	A	4.8974	V	5.15
1855	2017/04/11	17:24:42	0.789	A	4.8975	V	5.152778
1856	2017/04/11	17:24:52	0.789	A	4.8975	V	5.155556
1857	2017/04/11	17:25:02	0.788	A	4.8978	V	5.158333
1858	2017/04/11	17:25:12	0.787	A	4.8978	V	5.161111
1859	2017/04/11	17:25:22	0.787	A	4.8979	V	5.163889
1860	2017/04/11	17:25:32	0.787	A	4.8981	V	5.166667
1861	2017/04/11	17:25:42	0.785	A	4.8981	V	5.169444
1862	2017/04/11	17:25:52	0.785	A	4.8982	V	5.172222
1863	2017/04/11	17:26:02	0.786	A	4.8984	V	5.175
1864	2017/04/11	17:26:12	0.785	A	4.8984	V	5.177778
1865	2017/04/11	17:26:22	0.784	A	4.8986	V	5.180556
1866	2017/04/11	17:26:32	0.784	A	4.8986	V	5.183333
1867	2017/04/11	17:26:42	0.783	A	4.8987	V	5.186111
1868	2017/04/11	17:26:52	0.783	A	4.8988	V	5.188889
1869	2017/04/11	17:27:02	0.63	A	4.8988	V	5.191667
1870	2017/04/11	17:27:12	0.628	A	4.9244	V	5.194444
1871	2017/04/11	17:27:22	0.629	A	4.9237	V	5.197222
1872	2017/04/11	17:27:32	0.63	A	4.9236	V	5.2
1873	2017/04/11	17:27:42	0.632	A	4.9236	V	5.202778

1874	2017/04/11	17:27:52	0.63	A	4.9234	V	5.205556
1875	2017/04/11	17:28:02	0.63	A	4.9235	V	5.208333
1876	2017/04/11	17:28:12	0.629	A	4.9236	V	5.211111
1877	2017/04/11	17:28:22	0.628	A	4.9236	V	5.213889
1878	2017/04/11	17:28:32	0.631	A	4.9233	V	5.216667
1879	2017/04/11	17:28:42	0.627	A	4.9236	V	5.219444
1880	2017/04/11	17:28:52	0.63	A	4.9236	V	5.222222
1881	2017/04/11	17:29:02	0.63	A	4.9237	V	5.225
1882	2017/04/11	17:29:12	0.627	A	4.9238	V	5.227778
1883	2017/04/11	17:29:22	0.627	A	4.9237	V	5.230556
1884	2017/04/11	17:29:32	0.627	A	4.9237	V	5.233333
1885	2017/04/11	17:29:42	0.627	A	4.9238	V	5.236111
1886	2017/04/11	17:29:52	0.625	A	4.9237	V	5.238889
1887	2017/04/11	17:30:02	0.629	A	4.9241	V	5.241667
1888	2017/04/11	17:30:12	0.628	A	4.924	V	5.244444
1889	2017/04/11	17:30:22	0.625	A	4.9242	V	5.247222
1890	2017/04/11	17:30:32	0.626	A	4.9243	V	5.25
1891	2017/04/11	17:30:42	0.624	A	4.9245	V	5.252778
1892	2017/04/11	17:30:52	0.626	A	4.9245	V	5.255556
1893	2017/04/11	17:31:02	0.625	A	4.9245	V	5.258333
1894	2017/04/11	17:31:12	0.625	A	4.9244	V	5.261111
1895	2017/04/11	17:31:22	0.625	A	4.9243	V	5.263889
1896	2017/04/11	17:31:32	0.625	A	4.9248	V	5.266667
1897	2017/04/11	17:31:42	0.624	A	4.9247	V	5.269444
1898	2017/04/11	17:31:52	0.621	A	4.9248	V	5.272222
1899	2017/04/11	17:32:02	0.625	A	4.9248	V	5.275
1900	2017/04/11	17:32:12	0.625	A	4.9248	V	5.277778
1901	2017/04/11	17:32:22	0.623	A	4.9249	V	5.280556
1902	2017/04/11	17:32:32	0.621	A	4.925	V	5.283333
1903	2017/04/11	17:32:42	0.621	A	4.925	V	5.286111
1904	2017/04/11	17:32:52	0.621	A	4.9249	V	5.288889
1905	2017/04/11	17:33:02	0.621	A	4.9249	V	5.291667
1906	2017/04/11	17:33:12	0.619	A	4.9245	V	5.294444
1907	2017/04/11	17:33:22	0.617	A	4.9248	V	5.297222
1908	2017/04/11	17:33:32	0.619	A	4.9251	V	5.3
1909	2017/04/11	17:33:42	0.617	A	4.9252	V	5.302778
1910	2017/04/11	17:33:52	0.621	A	4.9252	V	5.305556
1911	2017/04/11	17:34:02	0.62	A	4.9253	V	5.308333
1912	2017/04/11	17:34:12	0.618	A	4.9253	V	5.311111
1913	2017/04/11	17:34:22	0.616	A	4.9253	V	5.313889
1914	2017/04/11	17:34:32	0.615	A	4.9254	V	5.316667
1915	2017/04/11	17:34:42	0.614	A	4.9254	V	5.319444
1916	2017/04/11	17:34:52	0.614	A	4.9254	V	5.322222
1917	2017/04/11	17:35:02	0.616	A	4.9255	V	5.325
1918	2017/04/11	17:35:12	0.615	A	4.9254	V	5.327778
1919	2017/04/11	17:35:22	0.613	A	4.9254	V	5.330556
1920	2017/04/11	17:35:32	0.614	A	4.9257	V	5.333333
1921	2017/04/11	17:35:42	0.612	A	4.9258	V	5.336111
1922	2017/04/11	17:35:52	0.611	A	4.9256	V	5.338889
1923	2017/04/11	17:36:02	0.611	A	4.9258	V	5.341667
1924	2017/04/11	17:36:12	0.613	A	4.9255	V	5.344444
1925	2017/04/11	17:36:22	0.611	A	4.9257	V	5.347222
1926	2017/04/11	17:36:32	0.607	A	4.9257	V	5.35
1927	2017/04/11	17:36:42	0.609	A	4.9257	V	5.352778
1928	2017/04/11	17:36:52	0.611	A	4.9263	V	5.355556
1929	2017/04/11	17:37:02	0.609	A	4.9259	V	5.358333
1930	2017/04/11	17:37:12	0.607	A	4.9257	V	5.361111
1931	2017/04/11	17:37:22	0.609	A	4.9258	V	5.363889
1932	2017/04/11	17:37:32	0.52	A	4.9354	V	5.366667
1933	2017/04/11	17:37:42	0.521	A	4.9349	V	5.369444
1934	2017/04/11	17:37:52	0.521	A	4.9349	V	5.372222
1935	2017/04/11	17:38:02	0.521	A	4.9346	V	5.375
1936	2017/04/11	17:38:12	0.518	A	4.9345	V	5.377778
1937	2017/04/11	17:38:22	0.518	A	4.9346	V	5.380556
1938	2017/04/11	17:38:32	0.52	A	4.9348	V	5.383333
1939	2017/04/11	17:38:42	0.517	A	4.9348	V	5.386111
1940	2017/04/11	17:38:52	0.519	A	4.9346	V	5.388889
1941	2017/04/11	17:39:02	0.52	A	4.9346	V	5.391667
1942	2017/04/11	17:39:12	0.519	A	4.9345	V	5.394444
1943	2017/04/11	17:39:22	0.515	A	4.9344	V	5.397222
1944	2017/04/11	17:39:32	0.515	A	4.9342	V	5.4
1945	2017/04/11	17:39:42	0.515	A	4.9344	V	5.402778
1946	2017/04/11	17:39:52	0.516	A	4.9344	V	5.405556
1947	2017/04/11	17:40:02	0.517	A	4.9343	V	5.408333
1948	2017/04/11	17:40:12	0.517	A	4.9343	V	5.411111
1949	2017/04/11	17:40:22	0.516	A	4.9344	V	5.413889
1950	2017/04/11	17:40:32	0.515	A	4.9345	V	5.416667
1951	2017/04/11	17:40:42	0.515	A	4.9347	V	5.419444
1952	2017/04/11	17:40:52	0.515	A	4.9347	V	5.422222
1953	2017/04/11	17:41:02	0.515	A	4.9348	V	5.425
1954	2017/04/11	17:41:12	0.515	A	4.9349	V	5.427778
1955	2017/04/11	17:41:22	0.515	A	4.9351	V	5.430556
1956	2017/04/11	17:41:32	0.513	A	4.9352	V	5.433333
1957	2017/04/11	17:41:42	0.514	A	4.9353	V	5.436111
1958	2017/04/11	17:41:52	0.514	A	4.9353	V	5.438889
1959	2017/04/11	17:42:02	0.514	A	4.9355	V	5.441667
1960	2017/04/11	17:42:12	0.515	A	4.9355	V	5.444444
1961	2017/04/11	17:42:22	0.513	A	4.9371	V	5.447222
1962	2017/04/11	17:42:32	0.513	A	4.9359	V	5.45
1963	2017/04/11	17:42:42	0.513	A	4.9358	V	5.452778
1964	2017/04/11	17:42:52	0.518	A	4.9362	V	5.455556
1965	2017/04/11	17:43:02	0.519	A	4.9378	V	5.458333
1966	2017/04/11	17:43:12	0.519	A	4.9379	V	5.461111
1967	2017/04/11	17:43:22	0.518	A	4.9382	V	5.463889

1968	2017/04/11	17:43:32	0.517	A	4.9381	V	5.466667
1969	2017/04/11	17:43:42	0.516	A	4.9382	V	5.469444
1970	2017/04/11	17:43:52	0.515	A	4.938	V	5.472222
1971	2017/04/11	17:44:02	0.517	A	4.9382	V	5.475
1972	2017/04/11	17:44:12	0.516	A	4.9383	V	5.477778
1973	2017/04/11	17:44:22	0.517	A	4.9384	V	5.480556
1974	2017/04/11	17:44:32	0.515	A	4.9385	V	5.483333
1975	2017/04/11	17:44:42	0.515	A	4.9387	V	5.486111
1976	2017/04/11	17:44:52	0.515	A	4.9386	V	5.488889
1977	2017/04/11	17:45:02	0.514	A	4.9387	V	5.491667
1978	2017/04/11	17:45:12	0.515	A	4.9388	V	5.494444
1979	2017/04/11	17:45:22	0.515	A	4.939	V	5.497222
1980	2017/04/11	17:45:32	0.515	A	4.9391	V	5.5
1981	2017/04/11	17:45:42	0.515	A	4.9393	V	5.502778
1982	2017/04/11	17:45:52	0.514	A	4.9394	V	5.505556
1983	2017/04/11	17:46:02	0.513	A	4.9393	V	5.508333
1984	2017/04/11	17:46:12	0.516	A	4.9403	V	5.511111
1985	2017/04/11	17:46:22	0.517	A	4.9404	V	5.513889
1986	2017/04/11	17:46:32	0.517	A	4.9406	V	5.516667
1987	2017/04/11	17:46:42	0.516	A	4.9407	V	5.519444
1988	2017/04/11	17:46:52	0.515	A	4.9408	V	5.522222
1989	2017/04/11	17:47:02	0.519	A	4.9427	V	5.525
1990	2017/04/11	17:47:12	0.518	A	4.9426	V	5.527778
1991	2017/04/11	17:47:22	0.519	A	4.9426	V	5.530556
1992	2017/04/11	17:47:32	0.518	A	4.9427	V	5.533333
1993	2017/04/11	17:47:42	0.519	A	4.9427	V	5.536111
1994	2017/04/11	17:47:52	0.519	A	4.9428	V	5.538889
1995	2017/04/11	17:48:02	0.516	A	4.9428	V	5.541667
1996	2017/04/11	17:48:12	0.518	A	4.943	V	5.544444
1997	2017/04/11	17:48:22	0.517	A	4.943	V	5.547222
1998	2017/04/11	17:48:32	0.517	A	4.9431	V	5.55
1999	2017/04/11	17:48:42	0.517	A	4.9434	V	5.552778
2000	2017/04/11	17:48:52	0.516	A	4.9434	V	5.555556
2001	2017/04/11	17:49:02	0.515	A	4.9435	V	5.558333
2002	2017/04/11	17:49:12	0.516	A	4.9437	V	5.561111
2003	2017/04/11	17:49:22	0.515	A	4.9439	V	5.563889
2004	2017/04/11	17:49:32	0.515	A	4.9439	V	5.566667
2005	2017/04/11	17:49:42	0.515	A	4.9438	V	5.569444
2006	2017/04/11	17:49:52	0.515	A	4.9442	V	5.572222
2007	2017/04/11	17:50:02	0.517	A	4.9451	V	5.575
2008	2017/04/11	17:50:12	0.519	A	4.9459	V	5.577778
2009	2017/04/11	17:50:22	0.517	A	4.9462	V	5.580556
2010	2017/04/11	17:50:32	0.518	A	4.9448	V	5.583333
2011	2017/04/11	17:50:42	0.517	A	4.9479	V	5.586111
2012	2017/04/11	17:50:52	0.293	A	4.9474	V	5.588889
2013	2017/04/11	17:51:02	0.294	A	4.9622	V	5.591667
2014	2017/04/11	17:51:12	0.293	A	4.9613	V	5.594444
2015	2017/04/11	17:51:22	0.293	A	4.961	V	5.597222
2016	2017/04/11	17:51:32	0.296	A	4.9609	V	5.6
2017	2017/04/11	17:51:42	0.296	A	4.9605	V	5.602778
2018	2017/04/11	17:51:52	0.297	A	4.9605	V	5.605556
2019	2017/04/11	17:52:02	0.294	A	4.9604	V	5.608333
2020	2017/04/11	17:52:12	0.295	A	4.9603	V	5.611111
2021	2017/04/11	17:52:22	0.297	A	4.9604	V	5.613889
2022	2017/04/11	17:52:32	0.297	A	4.9602	V	5.616667
2023	2017/04/11	17:52:42	0.297	A	4.9601	V	5.619444
2024	2017/04/11	17:52:52	0.295	A	4.9601	V	5.622222
2025	2017/04/11	17:53:02	0.295	A	4.9601	V	5.625
2026	2017/04/11	17:53:12	0.294	A	4.96	V	5.627778
2027	2017/04/11	17:53:22	0.296	A	4.9599	V	5.630556
2028	2017/04/11	17:53:32	0.296	A	4.96	V	5.633333
2029	2017/04/11	17:53:42	0.296	A	4.96	V	5.636111
2030	2017/04/11	17:53:52	0.295	A	4.9599	V	5.638889
2031	2017/04/11	17:54:02	0.296	A	4.9597	V	5.641667
2032	2017/04/11	17:54:12	0.295	A	4.9598	V	5.644444
2033	2017/04/11	17:54:22	0.296	A	4.9599	V	5.647222
2034	2017/04/11	17:54:32	0.295	A	4.9599	V	5.65
2035	2017/04/11	17:54:42	0.294	A	4.9598	V	5.652778
2036	2017/04/11	17:54:52	0.294	A	4.9598	V	5.655556
2037	2017/04/11	17:55:02	0.297	A	4.9598	V	5.658333
2038	2017/04/11	17:55:12	0.297	A	4.9599	V	5.661111
2039	2017/04/11	17:55:22	0.297	A	4.96	V	5.663889
2040	2017/04/11	17:55:32	0.296	A	4.96	V	5.666667
2041	2017/04/11	17:55:42	0.295	A	4.9601	V	5.669444
2042	2017/04/11	17:55:52	0.297	A	4.9601	V	5.672222
2043	2017/04/11	17:56:02	0.296	A	4.96	V	5.675
2044	2017/04/11	17:56:12	0.297	A	4.96	V	5.677778
2045	2017/04/11	17:56:22	0.296	A	4.9599	V	5.680556
2046	2017/04/11	17:56:32	0.295	A	4.96	V	5.683333
2047	2017/04/11	17:56:42	0.296	A	4.9602	V	5.686111
2048	2017/04/11	17:56:52	0.297	A	4.9602	V	5.688889
2049	2017/04/11	17:57:02	0.297	A	4.9603	V	5.691667
2050	2017/04/11	17:57:12	0.297	A	4.9603	V	5.694444
2051	2017/04/11	17:57:22	0.295	A	4.9605	V	5.697222
2052	2017/04/11	17:57:32	0.295	A	4.9603	V	5.7
2053	2017/04/11	17:57:42	0.294	A	4.9605	V	5.702778
2054	2017/04/11	17:57:52	0.296	A	4.9604	V	5.705556
2055	2017/04/11	17:58:02	0.297	A	4.9604	V	5.708333
2056	2017/04/11	17:58:12	0.298	A	4.9604	V	5.711111
2057	2017/04/11	17:58:22	0.293	A	4.9605	V	5.713889
2058	2017/04/11	17:58:32	0.29	A	4.9563	V	5.716667
2059	2017/04/11	17:58:42	0.295	A	4.9567	V	5.719444
2060	2017/04/11	17:58:52	0.293	A	4.957	V	5.722222
2061	2017/04/11	17:59:02	0.294	A	4.9571	V	5.725

2062	2017/04/11	17 59:12	0.293	A	4.9573	V	5.727778
2063	2017/04/11	17 59:22	0.291	A	4.9573	V	5.730556
2064	2017/04/11	17 59:32	0.29	A	4.9574	V	5.733333
2065	2017/04/11	17 59:42	0.292	A	4.9574	V	5.736111
2066	2017/04/11	17 59:52	0.292	A	4.9574	V	5.738889
2067	2017/04/11	18 00:02	0.294	A	4.9568	V	5.741667
2068	2017/04/11	18 00:12	0.294	A	4.9572	V	5.744444
2069	2017/04/11	18 00:22	0.293	A	4.9572	V	5.747222
2070	2017/04/11	18 00:32	0.293	A	4.9572	V	5.75
2071	2017/04/11	18 00:42	0.292	A	4.9573	V	5.752778
2072	2017/04/11	18 00:52	0.293	A	4.9574	V	5.755556
2073	2017/04/11	18 01:02	0.292	A	4.9573	V	5.758333
2074	2017/04/11	18 01:12	0.291	A	4.9575	V	5.761111
2075	2017/04/11	18 01:22	0.291	A	4.9576	V	5.763889
2076	2017/04/11	18 01:32	0.293	A	4.9574	V	5.766667
2077	2017/04/11	18 01:42	0.294	A	4.9576	V	5.769444
2078	2017/04/11	18 01:52	0.293	A	4.9575	V	5.772222
2079	2017/04/11	18 02:02	0.29	A	4.9576	V	5.775
2080	2017/04/11	18 02:12	0.291	A	4.9576	V	5.777778
2081	2017/04/11	18 02:22	0.29	A	4.9576	V	5.780556
2082	2017/04/11	18 02:32	0.293	A	4.9578	V	5.783333
2083	2017/04/11	18 02:42	0.293	A	4.9577	V	5.786111
2084	2017/04/11	18 02:52	0.294	A	4.9577	V	5.788889
2085	2017/04/11	18 03:02	0.292	A	4.9578	V	5.791667
2086	2017/04/11	18 03:12	0.291	A	4.9577	V	5.794444
2087	2017/04/11	18 03:22	0.29	A	4.9579	V	5.797222
2088	2017/04/11	18 03:32	0.292	A	4.9579	V	5.8
2089	2017/04/11	18 03:42	0.295	A	4.9579	V	5.802778
2090	2017/04/11	18 03:52	0.29	A	4.958	V	5.805556
2091	2017/04/11	18 04:02	0.29	A	4.958	V	5.808333
2092	2017/04/11	18 04:12	0.29	A	4.9578	V	5.811111
2093	2017/04/11	18 04:22	0.29	A	4.9578	V	5.813889
2094	2017/04/11	18 04:32	0.292	A	4.9578	V	5.816667
2095	2017/04/11	18 04:42	0.294	A	4.9578	V	5.819444
2096	2017/04/11	18 04:52	0.291	A	4.9579	V	5.822222
2097	2017/04/11	18 05:02	0.289	A	4.9581	V	5.825
2098	2017/04/11	18 05:12	0.291	A	4.9581	V	5.827778
2099	2017/04/11	18 05:22	0.292	A	4.958	V	5.830556
2100	2017/04/11	18 05:32	0.292	A	4.958	V	5.833333
2101	2017/04/11	18 05:42	0.293	A	4.958	V	5.836111
2102	2017/04/11	18 05:52	0.29	A	4.9579	V	5.838889
2103	2017/04/11	18 06:02	0.291	A	4.9577	V	5.841667
2104	2017/04/11	18 06:12	0.29	A	4.9579	V	5.844444
2105	2017/04/11	18 06:22	0.292	A	4.958	V	5.847222
2106	2017/04/11	18 06:32	0.29	A	4.9579	V	5.85
2107	2017/04/11	18 06:42	0.291	A	4.9577	V	5.852778
2108	2017/04/11	18 06:52	0.292	A	4.9579	V	5.855556
2109	2017/04/11	18 07:02	0.29	A	4.9578	V	5.858333
2110	2017/04/11	18 07:12	0.29	A	4.958	V	5.861111
2111	2017/04/11	18 07:22	0.29	A	4.9579	V	5.863889
2112	2017/04/11	18 07:32	0.29	A	4.958	V	5.866667
2113	2017/04/11	18 07:42	0.29	A	4.9579	V	5.869444
2114	2017/04/11	18 07:52	0.29	A	4.958	V	5.872222
2115	2017/04/11	18 08:02	0.291	A	4.9581	V	5.875
2116	2017/04/11	18 08:12	0.291	A	4.9581	V	5.877778
2117	2017/04/11	18 08:22	0.29	A	4.9581	V	5.880556
2118	2017/04/11	18 08:32	0.29	A	4.9582	V	5.883333
2119	2017/04/11	18 08:42	0.29	A	4.9581	V	5.886111
2120	2017/04/11	18 08:52	0.289	A	4.9582	V	5.888889
2121	2017/04/11	18 09:02	0.291	A	4.9582	V	5.891667
2122	2017/04/11	18 09:12	0.291	A	4.9582	V	5.894444
2123	2017/04/11	18 09:22	0.29	A	4.9583	V	5.897222
2124	2017/04/11	18 09:32	0.289	A	4.9582	V	5.9
2125	2017/04/11	18 09:42	0.288	A	4.9583	V	5.902778
2126	2017/04/11	18 09:52	0.289	A	4.9583	V	5.905556
2127	2017/04/11	18:10:02	0.291	A	4.9581	V	5.908333
2128	2017/04/11	18:10:12	0.29	A	4.9584	V	5.911111
2129	2017/04/11	18:10:22	0.291	A	4.9585	V	5.913889
2130	2017/04/11	18:10:32	0.289	A	4.9584	V	5.916667
2131	2017/04/11	18:10:42	0.289	A	4.9586	V	5.919444
2132	2017/04/11	18:10:52	0.288	A	4.9585	V	5.922222
2133	2017/04/11	18:11:02	0.29	A	4.9587	V	5.925
2134	2017/04/11	18:11:12	0.291	A	4.9587	V	5.927778
2135	2017/04/11	18:11:22	0.287	A	4.9585	V	5.930556
2136	2017/04/11	18:11:32	0.288	A	4.9585	V	5.933333
2137	2017/04/11	18:11:42	0.289	A	4.9586	V	5.936111
2138	2017/04/11	18:11:52	0.287	A	4.9586	V	5.938889
2139	2017/04/11	18:12:02	0.287	A	4.9586	V	5.941667
2140	2017/04/11	18:12:12	0.291	A	4.9586	V	5.944444
2141	2017/04/11	18:12:22	0.291	A	4.9586	V	5.947222
2142	2017/04/11	18:12:32	0.288	A	4.9587	V	5.95
2143	2017/04/11	18:12:42	0.288	A	4.9587	V	5.952778
2144	2017/04/11	18:12:52	0.287	A	4.9586	V	5.955556
2145	2017/04/11	18:13:02	0.29	A	4.9587	V	5.958333
2146	2017/04/11	18:13:12	0.289	A	4.9587	V	5.961111
2147	2017/04/11	18:13:22	0.289	A	4.9585	V	5.963889
2148	2017/04/11	18:13:32	0.287	A	4.9586	V	5.966667
2149	2017/04/11	18:13:42	0.287	A	4.9587	V	5.969444
2150	2017/04/11	18:13:52	0.288	A	4.9587	V	5.972222
2151	2017/04/11	18:14:02	0.288	A	4.9588	V	5.975
2152	2017/04/11	18:14:12	0.287	A	4.9586	V	5.977778
2153	2017/04/11	18:14:22	0.288	A	4.9586	V	5.980556
2154	2017/04/11	18:14:32	0.288	A	4.9587	V	5.983333
2155	2017/04/11	18:14:42	0.288	A	4.9587	V	5.986111

2156	2017/04/11	18:14:52	0.289	A	4.9587	V	5.988889
2157	2017/04/11	18:15:02	0.286	A	4.9587	V	5.991667
2158	2017/04/11	18:15:12	0.288	A	4.9586	V	5.994444
2159	2017/04/11	18:15:22	0.287	A	4.9586	V	5.997222
2160	2017/04/11	18:15:32	0.286	A	4.9589	V	6
2161	2017/04/11	18:15:42	0.288	A	4.9588	V	6.002778
2162	2017/04/11	18:15:52	0.289	A	4.9588	V	6.005556
2163	2017/04/11	18:16:02	0.287	A	4.9589	V	6.008333
2164	2017/04/11	18:16:12	0.286	A	4.9588	V	6.011111
2165	2017/04/11	18:16:22	0.287	A	4.9588	V	6.013889
2166	2017/04/11	18:16:32	0.289	A	4.9586	V	6.016667
2167	2017/04/11	18:16:42	0.288	A	4.9587	V	6.019444
2168	2017/04/11	18:16:52	0.286	A	4.9587	V	6.022222
2169	2017/04/11	18:17:02	0.286	A	4.9588	V	6.025
2170	2017/04/11	18:17:12	0.286	A	4.9588	V	6.027778
2171	2017/04/11	18:17:22	0.286	A	4.9589	V	6.030556
2172	2017/04/11	18:17:32	0.288	A	4.9588	V	6.033333
2173	2017/04/11	18:17:42	0.286	A	4.9587	V	6.036111
2174	2017/04/11	18:17:52	0.286	A	4.9583	V	6.038889
2175	2017/04/11	18:18:02	0.286	A	4.9581	V	6.041667
2176	2017/04/11	18:18:12	0.285	A	4.9581	V	6.044444
2177	2017/04/11	18:18:22	0.286	A	4.9583	V	6.047222
2178	2017/04/11	18:18:32	0.286	A	4.9582	V	6.05
2179	2017/04/11	18:18:42	0.286	A	4.9582	V	6.052778
2180	2017/04/11	18:18:52	0.285	A	4.9587	V	6.055556
2181	2017/04/11	18:19:02	0.285	A	4.9588	V	6.058333
2182	2017/04/11	18:19:12	0.285	A	4.9585	V	6.061111
2183	2017/04/11	18:19:22	0.285	A	4.9589	V	6.063889
2184	2017/04/11	18:19:32	0.285	A	4.9584	V	6.066667
2185	2017/04/11	18:19:42	0.286	A	4.9585	V	6.069444
2186	2017/04/11	18:19:52	0.284	A	4.9579	V	6.072222
2187	2017/04/11	18:20:02	0.284	A	4.9586	V	6.075
2188	2017/04/11	18:20:12	0.284	A	4.9592	V	6.077778
2189	2017/04/11	18:20:22	0.285	A	4.9592	V	6.080556
2190	2017/04/11	18:20:32	0.285	A	4.9586	V	6.083333
2191	2017/04/11	18:20:42	0.286	A	4.9583	V	6.086111
2192	2017/04/11	18:20:52	0.286	A	4.9586	V	6.088889
2193	2017/04/11	18:21:02	0.284	A	4.9587	V	6.091667
2194	2017/04/11	18:21:12	0.284	A	4.9591	V	6.094444
2195	2017/04/11	18:21:22	0.285	A	4.9587	V	6.097222
2196	2017/04/11	18:21:32	0.285	A	4.9588	V	6.1
2197	2017/04/11	18:21:42	0.285	A	4.9586	V	6.102778
2198	2017/04/11	18:21:52	0.284	A	4.9587	V	6.105556
2199	2017/04/11	18:22:02	0.285	A	4.9588	V	6.108333
2200	2017/04/11	18:22:12	0.284	A	4.9588	V	6.111111
2201	2017/04/11	18:22:22	0.285	A	4.959	V	6.113889
2202	2017/04/11	18:22:32	0.284	A	4.9585	V	6.116667
2203	2017/04/11	18:22:42	0.285	A	4.9589	V	6.119444
2204	2017/04/11	18:22:52	0.285	A	4.9591	V	6.122222
2205	2017/04/11	18:23:02	0.285	A	4.9595	V	6.125
2206	2017/04/11	18:23:12	0.285	A	4.9596	V	6.127778
2207	2017/04/11	18:23:22	0.284	A	4.9594	V	6.130556
2208	2017/04/11	18:23:32	0.285	A	4.9593	V	6.133333
2209	2017/04/11	18:23:42	0.283	A	4.9594	V	6.136111
2210	2017/04/11	18:23:52	0.285	A	4.9594	V	6.138889
2211	2017/04/11	18:24:02	0.285	A	4.9591	V	6.141667
2212	2017/04/11	18:24:12	0.284	A	4.9596	V	6.144444
2213	2017/04/11	18:24:22	0.285	A	4.9597	V	6.147222
2214	2017/04/11	18:24:32	0.281	A	4.9594	V	6.15
2215	2017/04/11	18:24:42	0.283	A	4.9597	V	6.152778
2216	2017/04/11	18:24:52	0.285	A	4.959	V	6.155556
2217	2017/04/11	18:25:02	0.284	A	4.9594	V	6.158333
2218	2017/04/11	18:25:12	0.285	A	4.9604	V	6.161111
2219	2017/04/11	18:25:22	0.284	A	4.9599	V	6.163889
2220	2017/04/11	18:25:32	0.284	A	4.9597	V	6.166667
2221	2017/04/11	18:25:42	0.283	A	4.96	V	6.169444
2222	2017/04/11	18:25:52	0.285	A	4.96	V	6.172222
2223	2017/04/11	18:26:02	0.283	A	4.9605	V	6.175
2224	2017/04/11	18:26:12	0.283	A	4.9599	V	6.177778
2225	2017/04/11	18:26:22	0.284	A	4.9596	V	6.180556
2226	2017/04/11	18:26:32	0.283	A	4.9603	V	6.183333
2227	2017/04/11	18:26:42	0.283	A	4.9603	V	6.186111
2228	2017/04/11	18:26:52	0.284	A	4.9604	V	6.188889
2229	2017/04/11	18:27:02	0.283	A	4.9603	V	6.191667
2230	2017/04/11	18:27:12	0.284	A	4.9602	V	6.194444
2231	2017/04/11	18:27:22	0.284	A	4.9605	V	6.197222
2232	2017/04/11	18:27:32	0.284	A	4.9605	V	6.2
2233	2017/04/11	18:27:42	0.282	A	4.9607	V	6.202778
2234	2017/04/11	18:27:52	0.283	A	4.9605	V	6.205556
2235	2017/04/11	18:28:02	0.282	A	4.9606	V	6.208333
2236	2017/04/11	18:28:12	0.284	A	4.9607	V	6.211111
2237	2017/04/11	18:28:22	0.282	A	4.9609	V	6.213889
2238	2017/04/11	18:28:32	0.282	A	4.9608	V	6.216667
2239	2017/04/11	18:28:42	0.282	A	4.961	V	6.219444
2240	2017/04/11	18:28:52	0.282	A	4.9607	V	6.222222
2241	2017/04/11	18:29:02	0.282	A	4.9609	V	6.225
2242	2017/04/11	18:29:12	0.282	A	4.961	V	6.227778
2243	2017/04/11	18:29:22	0.282	A	4.9611	V	6.230556
2244	2017/04/11	18:29:32	0.282	A	4.961	V	6.233333
2245	2017/04/11	18:29:42	0.282	A	4.961	V	6.236111
2246	2017/04/11	18:29:52	0.282	A	4.9609	V	6.238889
2247	2017/04/11	18:30:02	0.28	A	4.961	V	6.241667
2248	2017/04/11	18:30:12	0.282	A	4.9612	V	6.244444
2249	2017/04/11	18:30:22	0.282	A	4.9612	V	6.247222

2250	2017/04/11	18:30:32	0.284	A	4.9613	V	6.25
2251	2017/04/11	18:30:42	0.283	A	4.9612	V	6.252778
2252	2017/04/11	18:30:52	0.281	A	4.9614	V	6.255556
2253	2017/04/11	18:31:02	0.281	A	4.9612	V	6.258333
2254	2017/04/11	18:31:12	0.281	A	4.9612	V	6.261111
2255	2017/04/11	18:31:22	0.28	A	4.9615	V	6.263889
2256	2017/04/11	18:31:32	0.28	A	4.9614	V	6.266667
2257	2017/04/11	18:31:42	0.282	A	4.9613	V	6.269444
2258	2017/04/11	18:31:52	0.28	A	4.9616	V	6.272222
2259	2017/04/11	18:32:02	0.279	A	4.9616	V	6.275
2260	2017/04/11	18:32:12	0.279	A	4.9616	V	6.277778
2261	2017/04/11	18:32:22	0.279	A	4.9616	V	6.280556
2262	2017/04/11	18:32:32	0.283	A	4.9621	V	6.283333
2263	2017/04/11	18:32:42	0.282	A	4.9614	V	6.286111
2264	2017/04/11	18:32:52	0.282	A	4.9616	V	6.288889
2265	2017/04/11	18:33:02	0.28	A	4.9616	V	6.291667
2266	2017/04/11	18:33:12	0.28	A	4.9617	V	6.294444
2267	2017/04/11	18:33:22	0.28	A	4.9616	V	6.297222
2268	2017/04/11	18:33:32	0.281	A	4.9616	V	6.3
2269	2017/04/11	18:33:42	0.281	A	4.9617	V	6.302778
2270	2017/04/11	18:33:52	0.282	A	4.9616	V	6.305556
2271	2017/04/11	18:34:02	0.279	A	4.9617	V	6.308333
2272	2017/04/11	18:34:12	0.278	A	4.9617	V	6.311111
2273	2017/04/11	18:34:22	0.279	A	4.9617	V	6.313889
2274	2017/04/11	18:34:32	0.281	A	4.9618	V	6.316667
2275	2017/04/11	18:34:42	0.267	A	4.9618	V	6.319444
2276	2017/04/11	18:34:52	0.265	A	4.9642	V	6.322222
2277	2017/04/11	18:35:02	0.264	A	4.9641	V	6.325
2278	2017/04/11	18:35:12	0.265	A	4.9641	V	6.327778
2279	2017/04/11	18:35:22	0.264	A	4.9641	V	6.330556
2280	2017/04/11	18:35:32	0.266	A	4.964	V	6.333333
2281	2017/04/11	18:35:42	0.266	A	4.964	V	6.336111
2282	2017/04/11	18:35:52	0.267	A	4.9641	V	6.338889
2283	2017/04/11	18:36:02	0.265	A	4.9641	V	6.341667
2284	2017/04/11	18:36:12	0.266	A	4.9642	V	6.344444
2285	2017/04/11	18:36:22	0.264	A	4.9641	V	6.347222
2286	2017/04/11	18:36:32	0.266	A	4.9641	V	6.35
2287	2017/04/11	18:36:42	0.266	A	4.9639	V	6.352778
2288	2017/04/11	18:36:52	0.266	A	4.964	V	6.355556
2289	2017/04/11	18:37:02	0.264	A	4.9642	V	6.358333
2290	2017/04/11	18:37:12	0.265	A	4.9617	V	6.361111
2291	2017/04/11	18:37:22	0.264	A	4.962	V	6.363889
2292	2017/04/11	18:37:32	0.263	A	4.9616	V	6.366667
2293	2017/04/11	18:37:42	0.263	A	4.9616	V	6.369444
2294	2017/04/11	18:37:52	0.264	A	4.9617	V	6.372222
2295	2017/04/11	18:38:02	0.263	A	4.9615	V	6.375
2296	2017/04/11	18:38:12	0.26	A	4.9621	V	6.377778
2297	2017/04/11	18:38:22	0.258	A	4.9616	V	6.380556
2298	2017/04/11	18:38:32	0.257	A	4.9618	V	6.383333
2299	2017/04/11	18:38:42	0.258	A	4.9616	V	6.386111
2300	2017/04/11	18:38:52	0.261	A	4.9619	V	6.388889
2301	2017/04/11	18:39:02	0.261	A	4.9616	V	6.391667
2302	2017/04/11	18:39:12	0.26	A	4.9617	V	6.394444
2303	2017/04/11	18:39:22	0.259	A	4.9627	V	6.397222
2304	2017/04/11	18:39:32	0.256	A	4.9619	V	6.4
2305	2017/04/11	18:39:42	0.244	A	4.9617	V	6.402778
2306	2017/04/11	18:39:52	0.243	A	5.0173	V	6.405556
2307	2017/04/11	18:40:02	0.247	A	5.0175	V	6.408333
2308	2017/04/11	18:40:12	0.247	A	5.0177	V	6.411111
2309	2017/04/11	18:40:22	0.246	A	5.0178	V	6.413889
2310	2017/04/11	18:40:32	0.244	A	5.0177	V	6.416667
2311	2017/04/11	18:40:42	0.245	A	5.0176	V	6.419444
2312	2017/04/11	18:40:52	0.246	A	5.0175	V	6.422222
2313	2017/04/11	18:41:02	0.246	A	5.0175	V	6.425
2314	2017/04/11	18:41:12	0.244	A	5.0174	V	6.427778
2315	2017/04/11	18:41:22	0.244	A	5.0179	V	6.430556
2316	2017/04/11	18:41:32	0.243	A	5.0177	V	6.433333
2317	2017/04/11	18:41:42	0.246	A	5.0175	V	6.436111
2318	2017/04/11	18:41:52	0.245	A	5.0176	V	6.438889
2319	2017/04/11	18:42:02	0.244	A	5.0175	V	6.441667
2320	2017/04/11	18:42:12	0.245	A	5.0176	V	6.444444
2321	2017/04/11	18:42:22	0.247	A	5.0177	V	6.447222
2322	2017/04/11	18:42:32	0.244	A	5.0175	V	6.45
2323	2017/04/11	18:42:42	0.244	A	5.0175	V	6.452778
2324	2017/04/11	18:42:52	0.246	A	5.0175	V	6.455556
2325	2017/04/11	18:43:02	0.245	A	5.0151	V	6.458333
2326	2017/04/11	18:43:12	0.245	A	5.015	V	6.461111
2327	2017/04/11	18:43:22	0.225	A	5.0149	V	6.463889
2328	2017/04/11	18:43:32	0.224	A	5.0146	V	6.466667
2329	2017/04/11	18:43:42	0.228	A	5.0147	V	6.469444
2330	2017/04/11	18:43:52	0.228	A	5.0143	V	6.472222
2331	2017/04/11	18:44:02	0.226	A	5.0144	V	6.475
2332	2017/04/11	18:44:12	0.227	A	5.0145	V	6.477778
2333	2017/04/11	18:44:22	0.228	A	5.0145	V	6.480556
2334	2017/04/11	18:44:32	0.227	A	5.0144	V	6.483333
2335	2017/04/11	18:44:42	0.225	A	5.0144	V	6.486111
2336	2017/04/11	18:44:52	0.225	A	5.0142	V	6.488889
2337	2017/04/11	18:45:02	0.227	A	5.0151	V	6.491667 4th Green Light On.
2338	2017/04/11	18:45:12	0.226	A	5.0147	V	6.494444
2339	2017/04/11	18:45:22	0.225	A	5.0144	V	6.497222
2340	2017/04/11	18:45:32	0.225	A	5.0147	V	6.5
2341	2017/04/11	18:45:42	0.228	A	5.0146	V	6.502778
2342	2017/04/11	18:45:52	0.227	A	5.0145	V	6.505556
2343	2017/04/11	18:46:02	0.227	A	5.0144	V	6.508333

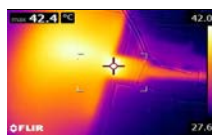
2344	2017/04/11	18:46:12	0.226	A	5.0145	V	6.511111
2345	2017/04/11	18:46:22	0.227	A	5.0142	V	6.513889
2346	2017/04/11	18:46:32	0.227	A	5.0143	V	6.516667
2347	2017/04/11	18:46:42	0.224	A	5.013	V	6.519444
2348	2017/04/11	18:46:52	0.217	A	5.0126	V	6.522222
2349	2017/04/11	18:47:02	0.217	A	5.0121	V	6.525
2350	2017/04/11	18:47:12	0.218	A	5.0121	V	6.527778
2351	2017/04/11	18:47:22	0.218	A	5.0126	V	6.530556
2352	2017/04/11	18:47:32	0.215	A	5.0119	V	6.533333
2353	2017/04/11	18:47:42	0.218	A	5.0125	V	6.536111
2354	2017/04/11	18:47:52	0.218	A	5.0125	V	6.538889
2355	2017/04/11	18:48:02	0.218	A	5.0134	V	6.541667
2356	2017/04/11	18:48:12	0.217	A	5.0121	V	6.544444
2357	2017/04/11	18:48:22	0.217	A	5.0118	V	6.547222
2358	2017/04/11	18:48:32	0.218	A	5.0082	V	6.55
2359	2017/04/11	18:48:42	0.201	A	5.0079	V	6.552778
2360	2017/04/11	18:48:52	0.201	A	5.0064	V	6.555556
2361	2017/04/11	18:49:02	0.202	A	5.0058	V	6.558333
2362	2017/04/11	18:49:12	0.204	A	5.0074	V	6.561111
2363	2017/04/11	18:49:22	0.204	A	5.0073	V	6.563889
2364	2017/04/11	18:49:32	0.203	A	5.0063	V	6.566667
2365	2017/04/11	18:49:42	0.204	A	5.0066	V	6.569444
2366	2017/04/11	18:49:52	0.203	A	5.0076	V	6.572222
2367	2017/04/11	18:50:02	0.205	A	5.0079	V	6.575
2368	2017/04/11	18:50:12	0.201	A	5.0066	V	6.577778
2369	2017/04/11	18:50:22	0.201	A	5.0058	V	6.580556
2370	2017/04/11	18:50:32	0.203	A	5.007	V	6.583333
2371	2017/04/11	18:50:42	0.202	A	5.0073	V	6.586111
2372	2017/04/11	18:50:52	0.201	A	5.0064	V	6.588889
2373	2017/04/11	18:51:02	0.201	A	5.0059	V	6.591667
2374	2017/04/11	18:51:12	0.203	A	5.0058	V	6.594444
2375	2017/04/11	18:51:22	0.202	A	5.0078	V	6.597222
2376	2017/04/11	18:51:32	0.203	A	5.0068	V	6.6
2377	2017/04/11	18:51:42	0.203	A	5.0056	V	6.602778
2378	2017/04/11	18:51:52	0.202	A	5.0061	V	6.605556
2379	2017/04/11	18:52:02	0.202	A	5.0067	V	6.608333
2380	2017/04/11	18:52:12	0.201	A	5.0071	V	6.611111
2381	2017/04/11	18:52:22	0.2	A	5.0057	V	6.613889
2382	2017/04/11	18:52:32	0.201	A	5.0058	V	6.616667
2383	2017/04/11	18:52:42	0.202	A	5.0043	V	6.619444
2384	2017/04/11	18:52:52	0.196	A	5.0043	V	6.622222
2385	2017/04/11	18:53:02	0.197	A	5.0024	V	6.625
2386	2017/04/11	18:53:12	0.198	A	5.0028	V	6.627778
2387	2017/04/11	18:53:22	0.198	A	5.0042	V	6.630556
2388	2017/04/11	18:53:32	0.199	A	5.0041	V	6.633333
2389	2017/04/11	18:53:42	0.195	A	5.012	V	6.636111
2390	2017/04/11	18:53:52	0.197	A	5.0109	V	6.638889
2391	2017/04/11	18:54:02	0.02	A	5.0106	V	6.641667 100 % Charged.
2392	2017/04/11	18:54:12	0.019	A	5.0103	V	6.644444

WORM 2 CASE TEMPERATURES DURING CHARGING

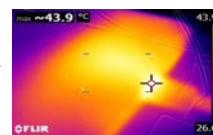
Start Charging.



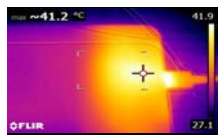
1st Light Flashing.



1st Light On,
2nd Light Flashing.



2nd Light On,
3rd Light Flashing.



3rd Light On,
4th Light Flashing.

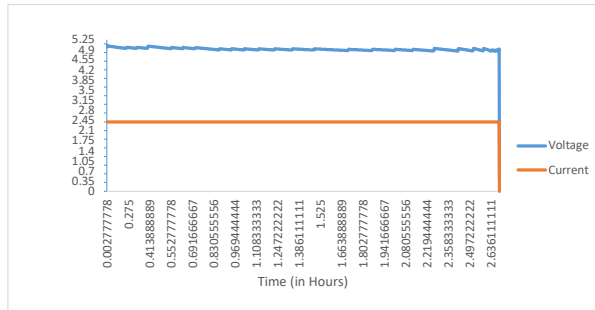


4th Light On.



Title	Note 2014			
Type	DCA_(181)			
MAX	2.398 A	16:35:39	5.0593 V	14:36:24
MIN	0 A	17:17:49	0.4013 V	17:17:54
AVG.	2.386 A		4.8963 V	

No	Date	Time	Value	Unit	Value	Unit	Time	Charge Status
1	2017/04/13	14:36:29	2.396 A		5.0593 V		0.002778	All 4 Green Lights On.
2	2017/04/13	14:36:39	2.396 A		5.0468 V		0.005556	
3	2017/04/13	14:36:49	2.394 A		5.0356 V		0.008333	
4	2017/04/13	14:36:59	2.395 A		5.0261 V		0.011111	
5	2017/04/13	14:37:09	2.395 A		5.0177 V		0.013889	
6	2017/04/13	14:37:19	2.395 A		5.0103 V		0.016667	
7	2017/04/13	14:37:29	2.395 A		5.0031 V		0.019444	
8	2017/04/13	14:37:39	2.396 A		4.9963 V		0.022222	
9	2017/04/13	14:37:49	2.396 A		4.9904 V		0.025	
10	2017/04/13	14:37:59	2.396 A		4.9849 V		0.027778	
11	2017/04/13	14:38:09	2.396 A		4.9795 V		0.030556	
12	2017/04/13	14:38:19	2.395 A		4.9745 V		0.033333	
13	2017/04/13	14:38:29	2.397 A		4.9695 V		0.036111	
14	2017/04/13	14:38:39	2.396 A		4.9653 V		0.038889	
15	2017/04/13	14:38:49	2.396 A		4.9613 V		0.041667	
16	2017/04/13	14:38:59	2.396 A		4.9575 V		0.044444	
17	2017/04/13	14:39:09	2.397 A		4.9536 V		0.047222	
18	2017/04/13	14:39:19	2.396 A		4.9495 V		0.05	
19	2017/04/13	14:39:29	2.396 A		4.9461 V		0.052778	
20	2017/04/13	14:39:39	2.396 A		4.9419 V		0.055556	
21	2017/04/13	14:39:49	2.396 A		4.9785 V		0.058333	
22	2017/04/13	14:39:59	2.396 A		4.9752 V		0.061111	
23	2017/04/13	14:40:09	2.394 A		4.9724 V		0.063889	
24	2017/04/13	14:40:19	2.396 A		4.9689 V		0.066667	
25	2017/04/13	14:40:29	2.395 A		4.9657 V		0.069444	
26	2017/04/13	14:40:39	2.397 A		4.9626 V		0.072222	
27	2017/04/13	14:40:49	2.396 A		4.9592 V		0.075	
28	2017/04/13	14:40:59	2.396 A		4.9569 V		0.077778	
29	2017/04/13	14:41:09	2.396 A		4.9537 V		0.080556	
30	2017/04/13	14:41:19	2.396 A		4.9511 V		0.083333	
31	2017/04/13	14:41:29	2.396 A		4.9481 V		0.086111	
32	2017/04/13	14:41:39	2.395 A		4.946 V		0.088889	
33	2017/04/13	14:41:49	2.397 A		4.9834 V		0.091667	
34	2017/04/13	14:41:59	2.396 A		4.9803 V		0.094444	
35	2017/04/13	14:42:09	2.394 A		4.9782 V		0.097222	
36	2017/04/13	14:42:19	2.396 A		4.9751 V		0.1	
37	2017/04/13	14:42:29	2.396 A		4.9729 V		0.102778	
38	2017/04/13	14:42:39	2.396 A		4.9701 V		0.105556	
39	2017/04/13	14:42:49	2.396 A		4.9678 V		0.108333	
40	2017/04/13	14:42:59	2.396 A		4.9656 V		0.111111	
41	2017/04/13	14:43:09	2.396 A		4.9629 V		0.113889	
42	2017/04/13	14:43:19	2.395 A		4.9607 V		0.116667	
43	2017/04/13	14:43:29	2.397 A		4.9584 V		0.119444	
44	2017/04/13	14:43:39	2.396 A		4.9558 V		0.122222	
45	2017/04/13	14:43:49	2.396 A		4.9538 V		0.125	
46	2017/04/13	14:43:59	2.396 A		4.9514 V		0.127778	
47	2017/04/13	14:44:09	2.396 A		4.9497 V		0.130556	
48	2017/04/13	14:44:19	2.396 A		4.9475 V		0.133333	
49	2017/04/13	14:44:29	2.396 A		4.9454 V		0.136111	
50	2017/04/13	14:44:39	2.396 A		4.9426 V		0.138889	
51	2017/04/13	14:44:49	2.397 A		5.0226 V		0.141667	
52	2017/04/13	14:44:59	2.395 A		5.0203 V		0.144444	
53	2017/04/13	14:45:09	2.396 A		5.0173 V		0.147222	
54	2017/04/13	14:45:19	2.397 A		5.0152 V		0.15	
55	2017/04/13	14:45:29	2.395 A		5.0132 V		0.152778	
56	2017/04/13	14:45:39	2.396 A		5.011 V		0.155556	
57	2017/04/13	14:45:49	2.396 A		5.009 V		0.158333	
58	2017/04/13	14:45:59	2.395 A		5.007 V		0.161111	
59	2017/04/13	14:46:09	2.396 A		5.0049 V		0.163889	
60	2017/04/13	14:46:19	2.396 A		5.0027 V		0.166667	
61	2017/04/13	14:46:29	2.397 A		5.0006 V		0.169444	
62	2017/04/13	14:46:39	2.396 A		4.9986 V		0.172222	
63	2017/04/13	14:46:49	2.397 A		4.9958 V		0.175	
64	2017/04/13	14:46:59	2.396 A		4.994 V		0.177778	
65	2017/04/13	14:47:09	2.395 A		4.992 V		0.180556	
66	2017/04/13	14:47:19	2.396 A		4.9901 V		0.183333	
67	2017/04/13	14:47:29	2.396 A		4.9883 V		0.186111	
68	2017/04/13	14:47:39	2.396 A		4.9867 V		0.188889	
69	2017/04/13	14:47:49	2.396 A		4.9818 V		0.191667	
70	2017/04/13	14:47:59	2.397 A		4.9813 V		0.194444	
71	2017/04/13	14:48:09	2.396 A		4.9794 V		0.197222	
72	2017/04/13	14:48:19	2.396 A		4.9774 V		0.2	
73	2017/04/13	14:48:29	2.397 A		4.9756 V		0.202778	
74	2017/04/13	14:48:39	2.396 A		4.9737 V		0.205556	
75	2017/04/13	14:48:49	2.396 A		4.972 V		0.208333	
76	2017/04/13	14:48:59	2.397 A		4.9706 V		0.211111	
77	2017/04/13	14:49:09	2.396 A		4.9686 V		0.213889	
78	2017/04/13	14:49:19	2.396 A		4.9657 V		0.216667	
79	2017/04/13	14:49:29	2.396 A		4.9647 V		0.219444	
80	2017/04/13	14:49:39	2.395 A		4.963 V		0.222222	



Time to Completely Discharge battery @ 2.4 A/h is 2 Hours 41 Minutes 20 Seconds
Average Worm 2 Capacity is 30.8 Wh.

4th Green Light (Bottom) Turns Off @ 015:20:19
Time to do this is 43 Minutes 50 Seconds.
Current Consumed is 1,753 mAh.
Battery Capacity Remaining is 4,698 mAh.

3rd Green Light Turns Off @ 16:10:39
Time to do this is 50 Minutes 20 Seconds.
Current Consumed is 2,013 mAh
Battery Capacity Remaining is 2,682 mAh.

2nd Green Light Turns Off @ 16:46:09
Time to do this is 35 Minutes 30 Seconds.
Current Consumed is 1,420 mAh.
Battery Capacity Remaining is 1,262 mAh.

1st Green Light Starts Flashing at 017:12:09
Time to do this is 26 Minutes 0 Seconds.
Current Consumed is 1,040 ma/h.
Battery Capacity Remaining is 222 mAh.

1st Green Light Turns Off @ 17:16:49
Time to do this is 4 Minutes 40 Seconds.
Current Consumed is 187 ma/h
Battery Capacity Remaining is 35 mAh.

81	2017/04/13	14:49:49	2.396 A	4.9612 V	0.225
82	2017/04/13	14:49:59	2.396 A	4.959 V	0.227778
83	2017/04/13	14 50:09	2.395 A	4.9578 V	0.230556
84	2017/04/13	14 50:19	2.395 A	4.956 V	0.233333
85	2017/04/13	14 50:29	2.397 A	4.9541 V	0.236111
86	2017/04/13	14 50:39	2.396 A	4.9519 V	0.238889
87	2017/04/13	14 50:49	2.396 A	4.9506 V	0.241667
88	2017/04/13	14 50:59	2.396 A	4.9488 V	0.244444
89	2017/04/13	14 51:09	2.396 A	4.9469 V	0.247222
90	2017/04/13	14 51:19	2.396 A	4.9449 V	0.25
91	2017/04/13	14 51:29	2.394 A	4.9434 V	0.252778
92	2017/04/13	14 51:39	2.396 A	4.9421 V	0.255556
93	2017/04/13	14 51:49	2.396 A	4.94 V	0.258333
94	2017/04/13	14 51:59	2.395 A	4.9378 V	0.261111
95	2017/04/13	14 52:09	2.397 A	4.9779 V	0.263889
96	2017/04/13	14 52:19	2.397 A	4.976 V	0.266667
97	2017/04/13	14 52:29	2.396 A	4.9739 V	0.269444
98	2017/04/13	14 52:39	2.396 A	4.9718 V	0.272222
99	2017/04/13	14 52:49	2.396 A	4.9707 V	0.275
100	2017/04/13	14 52:59	2.396 A	4.9689 V	0.277778
101	2017/04/13	14 53:09	2.397 A	4.9671 V	0.280556
102	2017/04/13	14 53:19	2.396 A	4.9652 V	0.283333
103	2017/04/13	14 53:29	2.396 A	4.9636 V	0.286111
104	2017/04/13	14 53:39	2.397 A	4.9619 V	0.288889
105	2017/04/13	14 53:49	2.396 A	4.9599 V	0.291667
106	2017/04/13	14 53:59	2.396 A	4.9582 V	0.294444
107	2017/04/13	14 54:09	2.396 A	4.9565 V	0.297222
108	2017/04/13	14 54:19	2.396 A	4.9552 V	0.3
109	2017/04/13	14 54:29	2.395 A	4.9534 V	0.302778
110	2017/04/13	14 54:39	2.395 A	4.9517 V	0.305556
111	2017/04/13	14 54:49	2.396 A	4.9501 V	0.308333
112	2017/04/13	14 54:59	2.396 A	4.9483 V	0.311111
113	2017/04/13	14 55:09	2.396 A	4.9467 V	0.313889
114	2017/04/13	14 55:19	2.397 A	4.945 V	0.316667
115	2017/04/13	14 55:29	2.396 A	4.9433 V	0.319444
116	2017/04/13	14 55:39	2.397 A	4.9415 V	0.322222
117	2017/04/13	14 55:49	2.396 A	4.9396 V	0.325
118	2017/04/13	14 55:59	2.395 A	4.9384 V	0.327778
119	2017/04/13	14 56:09	2.395 A	4.9782 V	0.330556
120	2017/04/13	14 56:19	2.396 A	4.9756 V	0.333333
121	2017/04/13	14 56:29	2.396 A	4.9745 V	0.336111
122	2017/04/13	14 56:39	2.395 A	4.9728 V	0.338889
123	2017/04/13	14 56:49	2.395 A	4.971 V	0.341667
124	2017/04/13	14 56:59	2.396 A	4.9689 V	0.344444
125	2017/04/13	14 57:09	2.396 A	4.9676 V	0.347222
126	2017/04/13	14 57:19	2.396 A	4.9656 V	0.35
127	2017/04/13	14 57:29	2.396 A	4.9644 V	0.352778
128	2017/04/13	14 57:39	2.395 A	4.9627 V	0.355556
129	2017/04/13	14 57:49	2.395 A	4.9609 V	0.358333
130	2017/04/13	14 57:59	2.396 A	4.9591 V	0.361111
131	2017/04/13	14 58:09	2.396 A	4.9577 V	0.363889
132	2017/04/13	14 58:19	2.396 A	4.9556 V	0.366667
133	2017/04/13	14 58:29	2.395 A	4.9544 V	0.369444
134	2017/04/13	14 58:39	2.396 A	4.9523 V	0.372222
135	2017/04/13	14 58:49	2.396 A	4.9512 V	0.375
136	2017/04/13	14 58:59	2.396 A	4.9493 V	0.377778
137	2017/04/13	14 59:09	2.397 A	4.9477 V	0.380556
138	2017/04/13	14 59:19	2.397 A	4.9464 V	0.383333
139	2017/04/13	14 59:29	2.396 A	4.9444 V	0.386111
140	2017/04/13	14 59:39	2.396 A	4.9432 V	0.388889
141	2017/04/13	14 59:49	2.397 A	4.9412 V	0.391667
142	2017/04/13	14 59:59	2.395 A	4.9396 V	0.394444
143	2017/04/13	15 00:09	2.396 A	4.938 V	0.397222
144	2017/04/13	15 00:19	2.396 A	4.9368 V	0.4
145	2017/04/13	15 00:29	2.396 A	5.0194 V	0.402778
146	2017/04/13	15 00:39	2.397 A	5.017 V	0.405556
147	2017/04/13	15 00:49	2.395 A	5.0151 V	0.408333
148	2017/04/13	15 00:59	2.396 A	5.0133 V	0.411111
149	2017/04/13	15 01:09	2.396 A	5.0115 V	0.413889
150	2017/04/13	15 01:19	2.395 A	5.0102 V	0.416667
151	2017/04/13	15 01:29	2.395 A	5.0081 V	0.419444
152	2017/04/13	15 01:39	2.396 A	5.0067 V	0.422222
153	2017/04/13	15 01:49	2.396 A	5.0043 V	0.425
154	2017/04/13	15 01:59	2.396 A	5.0033 V	0.427778
155	2017/04/13	15 02:09	2.394 A	5.0016 V	0.430556
156	2017/04/13	15 02:19	2.395 A	5 V	0.433333
157	2017/04/13	15 02:29	2.396 A	4.9982 V	0.436111
158	2017/04/13	15 02:39	2.396 A	4.9962 V	0.438889
159	2017/04/13	15 02:49	2.396 A	4.9949 V	0.441667
160	2017/04/13	15 02:59	2.396 A	4.9929 V	0.444444
161	2017/04/13	15 03:09	2.396 A	4.9916 V	0.447222
162	2017/04/13	15 03:19	2.395 A	4.99 V	0.45
163	2017/04/13	15 03:29	2.396 A	4.9883 V	0.452778
164	2017/04/13	15 03:39	2.396 A	4.9865 V	0.455556
165	2017/04/13	15 03:49	2.396 A	4.9852 V	0.458333
166	2017/04/13	15 03:59	2.395 A	4.9834 V	0.461111
167	2017/04/13	15 04:09	2.396 A	4.9819 V	0.463889

168	2017/04/13	15 04:19	2.396 A	4.9804 V	0.466667
169	2017/04/13	15 04:29	2.397 A	4.9786 V	0.469444
170	2017/04/13	15 04:39	2.396 A	4.977 V	0.472222
171	2017/04/13	15 04:49	2.396 A	4.9756 V	0.475
172	2017/04/13	15 04:59	2.396 A	4.9736 V	0.477778
173	2017/04/13	15 05:09	2.395 A	4.9724 V	0.480556
174	2017/04/13	15 05:19	2.396 A	4.9704 V	0.483333
175	2017/04/13	15 05:29	2.397 A	4.9689 V	0.486111
176	2017/04/13	15 05:39	2.395 A	4.9672 V	0.488889
177	2017/04/13	15 05:49	2.396 A	4.9651 V	0.491667
178	2017/04/13	15 05:59	2.396 A	4.9634 V	0.494444
179	2017/04/13	15 06:09	2.396 A	4.962 V	0.497222
180	2017/04/13	15 06:19	2.395 A	4.9605 V	0.5
181	2017/04/13	15 06:29	2.396 A	4.9586 V	0.502778
182	2017/04/13	15 06:39	2.396 A	4.9575 V	0.505556
183	2017/04/13	15 06:49	2.396 A	4.9553 V	0.508333
184	2017/04/13	15 06:59	2.396 A	4.9543 V	0.511111
185	2017/04/13	15 07:09	2.396 A	4.9529 V	0.513889
186	2017/04/13	15 07:19	2.397 A	4.9513 V	0.516667
187	2017/04/13	15 07:29	2.395 A	4.9496 V	0.519444
188	2017/04/13	15 07:39	2.396 A	4.9484 V	0.522222
189	2017/04/13	15 07:49	2.396 A	4.9469 V	0.525
190	2017/04/13	15 07:59	2.396 A	4.9454 V	0.527778
191	2017/04/13	15 08:09	2.397 A	4.9439 V	0.530556
192	2017/04/13	15 08:19	2.396 A	4.9424 V	0.533333
193	2017/04/13	15 08:29	2.396 A	4.9408 V	0.536111
194	2017/04/13	15 08:39	2.397 A	4.9394 V	0.538889
195	2017/04/13	15 08:49	2.396 A	4.9371 V	0.541667
196	2017/04/13	15 08:59	2.396 A	4.9355 V	0.544444
197	2017/04/13	15 09:09	2.396 A	4.9347 V	0.547222
198	2017/04/13	15 09:19	2.397 A	4.9329 V	0.55
199	2017/04/13	15 09:29	2.396 A	4.9308 V	0.552778
200	2017/04/13	15 09:39	2.395 A	4.9722 V	0.555556
201	2017/04/13	15 09:49	2.395 A	4.9708 V	0.558333
202	2017/04/13	15 09:59	2.395 A	4.969 V	0.561111
203	2017/04/13	15:10:09	2.396 A	4.9674 V	0.563889
204	2017/04/13	15:10:19	2.395 A	4.9657 V	0.566667
205	2017/04/13	15:10:29	2.397 A	4.9636 V	0.569444
206	2017/04/13	15:10:39	2.397 A	4.9624 V	0.572222
207	2017/04/13	15:10:49	2.396 A	4.9604 V	0.575
208	2017/04/13	15:10:59	2.396 A	4.9592 V	0.577778
209	2017/04/13	15:11:09	2.396 A	4.9575 V	0.580556
210	2017/04/13	15:11:19	2.396 A	4.9558 V	0.583333
211	2017/04/13	15:11:29	2.397 A	4.954 V	0.586111
212	2017/04/13	15:11:39	2.396 A	4.9528 V	0.588889
213	2017/04/13	15:11:49	2.396 A	4.951 V	0.591667
214	2017/04/13	15:11:59	2.396 A	4.9498 V	0.594444
215	2017/04/13	15:12:09	2.396 A	4.9482 V	0.597222
216	2017/04/13	15:12:19	2.396 A	4.9467 V	0.6
217	2017/04/13	15:12:29	2.396 A	4.945 V	0.602778
218	2017/04/13	15:12:39	2.396 A	4.943 V	0.605556
219	2017/04/13	15:12:49	2.395 A	4.9419 V	0.608333
220	2017/04/13	15:12:59	2.395 A	4.9404 V	0.611111
221	2017/04/13	15:13:09	2.395 A	4.9387 V	0.613889
222	2017/04/13	15:13:19	2.397 A	4.9369 V	0.616667
223	2017/04/13	15:13:29	2.397 A	4.9357 V	0.619444
224	2017/04/13	15:13:39	2.395 A	4.9339 V	0.622222
225	2017/04/13	15:13:49	2.395 A	4.9325 V	0.625
226	2017/04/13	15:13:59	2.396 A	4.9306 V	0.627778
227	2017/04/13	15:14:09	2.396 A	4.9719 V	0.630556
228	2017/04/13	15:14:19	2.396 A	4.97 V	0.633333
229	2017/04/13	15:14:29	2.396 A	4.9685 V	0.636111
230	2017/04/13	15:14:39	2.396 A	4.9667 V	0.638889
231	2017/04/13	15:14:49	2.395 A	4.9647 V	0.641667
232	2017/04/13	15:14:59	2.396 A	4.9635 V	0.644444
233	2017/04/13	15:15:09	2.396 A	4.9616 V	0.647222
234	2017/04/13	15:15:19	2.397 A	4.9596 V	0.65
235	2017/04/13	15:15:29	2.396 A	4.9579 V	0.652778
236	2017/04/13	15:15:39	2.396 A	4.9569 V	0.655556
237	2017/04/13	15:15:49	2.397 A	4.9552 V	0.658333
238	2017/04/13	15:15:59	2.396 A	4.9538 V	0.661111
239	2017/04/13	15:16:09	2.396 A	4.9522 V	0.663889
240	2017/04/13	15:16:19	2.396 A	4.9506 V	0.666667
241	2017/04/13	15:16:29	2.396 A	4.9486 V	0.669444
242	2017/04/13	15:16:39	2.395 A	4.9475 V	0.672222
243	2017/04/13	15:16:49	2.396 A	4.9456 V	0.675
244	2017/04/13	15:16:59	2.397 A	4.9442 V	0.677778
245	2017/04/13	15:17:09	2.394 A	4.9426 V	0.680556
246	2017/04/13	15:17:19	2.396 A	4.9411 V	0.683333
247	2017/04/13	15:17:29	2.396 A	4.9394 V	0.686111
248	2017/04/13	15:17:39	2.397 A	4.938 V	0.688889
249	2017/04/13	15:17:49	2.396 A	4.9366 V	0.691667
250	2017/04/13	15:17:59	2.396 A	4.935 V	0.694444
251	2017/04/13	15:18:09	2.397 A	4.9327 V	0.697222
252	2017/04/13	15:18:19	2.396 A	4.9319 V	0.7
253	2017/04/13	15:18:29	2.396 A	4.9303 V	0.702778
254	2017/04/13	15:18:39	2.397 A	4.9288 V	0.705556

255	2017/04/13	15:18:49	2.396	A	4.9271	V	0.708333
256	2017/04/13	15:18:59	2.396	A	4.9685	V	0.711111
257	2017/04/13	15:19:09	2.396	A	4.9669	V	0.713889
258	2017/04/13	15:19:19	2.396	A	4.9649	V	0.716667
259	2017/04/13	15:19:29	2.396	A	4.9632	V	0.719444
260	2017/04/13	15:19:39	2.395	A	4.9614	V	0.722222
261	2017/04/13	15:19:49	2.396	A	4.9597	V	0.725
262	2017/04/13	15:19:59	2.395	A	4.9585	V	0.727778
263	2017/04/13	15:20:09	2.396	A	4.9568	V	0.730556
264	2017/04/13	15:20:19	2.396	A	4.9541	V	0.733333
265	2017/04/13	15:20:29	2.396	A	4.9529	V	0.736111
266	2017/04/13	15:20:39	2.396	A	4.951	V	0.738889
267	2017/04/13	15:20:49	2.396	A	4.9495	V	0.741667
268	2017/04/13	15:20:59	2.397	A	4.9515	V	0.744444
269	2017/04/13	15:21:09	2.395	A	4.9476	V	0.747222
270	2017/04/13	15:21:19	2.396	A	4.9468	V	0.75
271	2017/04/13	15:21:29	2.395	A	4.9456	V	0.752778
272	2017/04/13	15:21:39	2.395	A	4.9444	V	0.755556
273	2017/04/13	15:21:49	2.395	A	4.9409	V	0.758333
274	2017/04/13	15:21:59	2.396	A	4.9401	V	0.761111
275	2017/04/13	15:22:09	2.395	A	4.9395	V	0.763889
276	2017/04/13	15:22:19	2.396	A	4.9382	V	0.766667
277	2017/04/13	15:22:29	2.396	A	4.9363	V	0.769444
278	2017/04/13	15:22:39	2.396	A	4.935	V	0.772222
279	2017/04/13	15:22:49	2.396	A	4.9336	V	0.775
280	2017/04/13	15:22:59	2.396	A	4.9321	V	0.777778
281	2017/04/13	15:23:09	2.396	A	4.9307	V	0.780556
282	2017/04/13	15:23:19	2.397	A	4.9292	V	0.783333
283	2017/04/13	15:23:29	2.396	A	4.9278	V	0.786111
284	2017/04/13	15:23:39	2.397	A	4.9264	V	0.788889
285	2017/04/13	15:23:49	2.396	A	4.9251	V	0.791667
286	2017/04/13	15:23:59	2.396	A	4.9238	V	0.794444
287	2017/04/13	15:24:09	2.397	A	4.9222	V	0.797222
288	2017/04/13	15:24:19	2.397	A	4.9208	V	0.8
289	2017/04/13	15:24:29	2.395	A	4.9192	V	0.802778
290	2017/04/13	15:24:39	2.396	A	4.9179	V	0.805556
291	2017/04/13	15:24:49	2.397	A	4.9164	V	0.808333
292	2017/04/13	15:24:59	2.396	A	4.915	V	0.811111
293	2017/04/13	15:25:09	2.396	A	4.9133	V	0.813889
294	2017/04/13	15:25:19	2.396	A	4.912	V	0.816667
295	2017/04/13	15:25:29	2.396	A	4.9106	V	0.819444
296	2017/04/13	15:25:39	2.397	A	4.909	V	0.822222
297	2017/04/13	15:25:49	2.396	A	4.9077	V	0.825
298	2017/04/13	15:25:59	2.395	A	4.9062	V	0.827778
299	2017/04/13	15:26:09	2.396	A	4.9048	V	0.830556
300	2017/04/13	15:26:19	2.396	A	4.9034	V	0.833333
301	2017/04/13	15:26:29	2.397	A	4.9017	V	0.836111
302	2017/04/13	15:26:39	2.397	A	4.9005	V	0.838889
303	2017/04/13	15:26:49	2.395	A	4.899	V	0.841667
304	2017/04/13	15:26:59	2.397	A	4.8971	V	0.844444
305	2017/04/13	15:27:09	2.397	A	4.896	V	0.847222
306	2017/04/13	15:27:19	2.397	A	4.8946	V	0.85
307	2017/04/13	15:27:29	2.397	A	4.8932	V	0.852778
308	2017/04/13	15:27:39	2.396	A	4.8917	V	0.855556
309	2017/04/13	15:27:49	2.396	A	4.8897	V	0.858333
310	2017/04/13	15:27:59	2.395	A	4.8885	V	0.861111
311	2017/04/13	15:28:09	2.396	A	4.8872	V	0.863889
312	2017/04/13	15:28:19	2.396	A	4.8855	V	0.866667
313	2017/04/13	15:28:29	2.395	A	4.9271	V	0.869444
314	2017/04/13	15:28:39	2.396	A	4.9252	V	0.872222
315	2017/04/13	15:28:49	2.395	A	4.9233	V	0.875
316	2017/04/13	15:28:59	2.395	A	4.9222	V	0.877778
317	2017/04/13	15:29:09	2.396	A	4.9201	V	0.880556
318	2017/04/13	15:29:19	2.396	A	4.9181	V	0.883333
319	2017/04/13	15:29:29	2.396	A	4.9169	V	0.886111
320	2017/04/13	15:29:39	2.396	A	4.9154	V	0.888889
321	2017/04/13	15:29:49	2.395	A	4.914	V	0.891667
322	2017/04/13	15:29:59	2.396	A	4.9125	V	0.894444
323	2017/04/13	15:30:09	2.396	A	4.9109	V	0.897222
324	2017/04/13	15:30:19	2.396	A	4.9098	V	0.9
325	2017/04/13	15:30:29	2.396	A	4.9084	V	0.902778
326	2017/04/13	15:30:39	2.396	A	4.9062	V	0.905556
327	2017/04/13	15:30:49	2.395	A	4.9053	V	0.908333
328	2017/04/13	15:30:59	2.396	A	4.904	V	0.911111
329	2017/04/13	15:31:09	2.396	A	4.9027	V	0.913889
330	2017/04/13	15:31:19	2.396	A	4.9014	V	0.916667
331	2017/04/13	15:31:29	2.395	A	4.8992	V	0.919444
332	2017/04/13	15:31:39	2.397	A	4.8985	V	0.922222
333	2017/04/13	15:31:49	2.396	A	4.8971	V	0.925
334	2017/04/13	15:31:59	2.396	A	4.8956	V	0.927778
335	2017/04/13	15:32:09	2.396	A	4.8939	V	0.930556
336	2017/04/13	15:32:19	2.396	A	4.8927	V	0.933333
337	2017/04/13	15:32:29	2.396	A	4.8912	V	0.936111
338	2017/04/13	15:32:39	2.395	A	4.8896	V	0.938889
339	2017/04/13	15:32:49	2.395	A	4.8882	V	0.941667
340	2017/04/13	15:32:59	2.394	A	4.8865	V	0.944444
341	2017/04/13	15:33:09	2.395	A	4.9285	V	0.947222

4th Green Light Turns Off.

342	2017/04/13	15:33:19	2.396 A	4.9264 V	0.95
343	2017/04/13	15:33:29	2.396 A	4.9253 V	0.952778
344	2017/04/13	15:33:39	2.395 A	4.9236 V	0.955556
345	2017/04/13	15:33:49	2.396 A	4.922 V	0.958333
346	2017/04/13	15:33:59	2.395 A	4.9202 V	0.961111
347	2017/04/13	15:34:09	2.396 A	4.919 V	0.963889
348	2017/04/13	15:34:19	2.396 A	4.9176 V	0.966667
349	2017/04/13	15:34:29	2.395 A	4.9159 V	0.969444
350	2017/04/13	15:34:39	2.396 A	4.9145 V	0.972222
351	2017/04/13	15:34:49	2.396 A	4.9128 V	0.975
352	2017/04/13	15:34:59	2.396 A	4.9113 V	0.977778
353	2017/04/13	15:35:09	2.396 A	4.91 V	0.980556
354	2017/04/13	15:35:19	2.396 A	4.9086 V	0.983333
355	2017/04/13	15:35:29	2.397 A	4.9071 V	0.986111
356	2017/04/13	15:35:39	2.395 A	4.9056 V	0.988889
357	2017/04/13	15:35:49	2.395 A	4.9042 V	0.991667
358	2017/04/13	15:35:59	2.396 A	4.9026 V	0.994444
359	2017/04/13	15:36:09	2.395 A	4.9012 V	0.997222
360	2017/04/13	15:36:19	2.396 A	4.8998 V	1
361	2017/04/13	15:36:29	2.397 A	4.8984 V	1.002778
362	2017/04/13	15:36:39	2.395 A	4.897 V	1.005556
363	2017/04/13	15:36:49	2.396 A	4.8956 V	1.008333
364	2017/04/13	15:36:59	2.396 A	4.894 V	1.011111
365	2017/04/13	15:37:09	2.396 A	4.8928 V	1.013889
366	2017/04/13	15:37:19	2.395 A	4.8912 V	1.016667
367	2017/04/13	15:37:29	2.396 A	4.8899 V	1.019444
368	2017/04/13	15:37:39	2.396 A	4.8885 V	1.022222
369	2017/04/13	15:37:49	2.397 A	4.887 V	1.025
370	2017/04/13	15:37:59	2.396 A	4.8854 V	1.027778
371	2017/04/13	15:38:09	2.397 A	4.9279 V	1.030556
372	2017/04/13	15:38:19	2.396 A	4.9262 V	1.033333
373	2017/04/13	15:38:29	2.396 A	4.9248 V	1.036111
374	2017/04/13	15:38:39	2.396 A	4.9232 V	1.038889
375	2017/04/13	15:38:49	2.395 A	4.9218 V	1.041667
376	2017/04/13	15:38:59	2.396 A	4.9203 V	1.044444
377	2017/04/13	15:39:09	2.394 A	4.919 V	1.047222
378	2017/04/13	15:39:19	2.397 A	4.9174 V	1.05
379	2017/04/13	15:39:29	2.395 A	4.916 V	1.052778
380	2017/04/13	15:39:39	2.396 A	4.9147 V	1.055556
381	2017/04/13	15:39:49	2.396 A	4.9133 V	1.058333
382	2017/04/13	15:39:59	2.395 A	4.9117 V	1.061111
383	2017/04/13	15:40:09	2.396 A	4.9105 V	1.063889
384	2017/04/13	15:40:19	2.396 A	4.9092 V	1.066667
385	2017/04/13	15:40:29	2.396 A	4.9078 V	1.069444
386	2017/04/13	15:40:39	2.396 A	4.9065 V	1.072222
387	2017/04/13	15:40:49	2.396 A	4.9051 V	1.075
388	2017/04/13	15:40:59	2.397 A	4.9035 V	1.077778
389	2017/04/13	15:41:09	2.396 A	4.9025 V	1.080556
390	2017/04/13	15:41:19	2.396 A	4.9011 V	1.083333
391	2017/04/13	15:41:29	2.396 A	4.9 V	1.086111
392	2017/04/13	15:41:39	2.395 A	4.8986 V	1.088889
393	2017/04/13	15:41:49	2.397 A	4.8972 V	1.091667
394	2017/04/13	15:41:59	2.394 A	4.896 V	1.094444
395	2017/04/13	15:42:09	2.395 A	4.8947 V	1.097222
396	2017/04/13	15:42:19	2.395 A	4.8934 V	1.1
397	2017/04/13	15:42:29	2.395 A	4.8922 V	1.102778
398	2017/04/13	15:42:39	2.395 A	4.891 V	1.105556
399	2017/04/13	15:42:49	2.397 A	4.8897 V	1.108333
400	2017/04/13	15:42:59	2.395 A	4.8884 V	1.111111
401	2017/04/13	15:43:09	2.397 A	4.8871 V	1.113889
402	2017/04/13	15:43:19	2.396 A	4.8859 V	1.116667
403	2017/04/13	15:43:29	2.396 A	4.8846 V	1.119444
404	2017/04/13	15:43:39	2.396 A	4.8836 V	1.122222
405	2017/04/13	15:43:49	2.396 A	4.926 V	1.125
406	2017/04/13	15:43:59	2.395 A	4.9248 V	1.127778
407	2017/04/13	15:44:09	2.396 A	4.9234 V	1.130556
408	2017/04/13	15:44:19	2.395 A	4.9219 V	1.133333
409	2017/04/13	15:44:29	2.396 A	4.9206 V	1.136111
410	2017/04/13	15:44:39	2.396 A	4.9193 V	1.138889
411	2017/04/13	15:44:49	2.395 A	4.9179 V	1.141667
412	2017/04/13	15:44:59	2.397 A	4.9166 V	1.144444
413	2017/04/13	15:45:09	2.396 A	4.9154 V	1.147222
414	2017/04/13	15:45:19	2.396 A	4.9142 V	1.15
415	2017/04/13	15:45:29	2.395 A	4.9129 V	1.152778
416	2017/04/13	15:45:39	2.397 A	4.9116 V	1.155556
417	2017/04/13	15:45:49	2.395 A	4.9104 V	1.158333
418	2017/04/13	15:45:59	2.397 A	4.9089 V	1.161111
419	2017/04/13	15:46:09	2.396 A	4.9081 V	1.163889
420	2017/04/13	15:46:19	2.397 A	4.9069 V	1.166667
421	2017/04/13	15:46:29	2.397 A	4.9056 V	1.169444
422	2017/04/13	15:46:39	2.395 A	4.9045 V	1.172222
423	2017/04/13	15:46:49	2.396 A	4.9033 V	1.175
424	2017/04/13	15:46:59	2.395 A	4.9021 V	1.177778
425	2017/04/13	15:47:09	2.395 A	4.9009 V	1.180556
426	2017/04/13	15:47:19	2.396 A	4.8998 V	1.183333
427	2017/04/13	15:47:29	2.395 A	4.8985 V	1.186111
428	2017/04/13	15:47:39	2.395 A	4.8974 V	1.188889

429	2017/04/13	15:47:49	2.396	A	4.8963	V	1.191667
430	2017/04/13	15:47:59	2.396	A	4.8952	V	1.194444
431	2017/04/13	15:48:09	2.395	A	4.8941	V	1.197222
432	2017/04/13	15:48:19	2.397	A	4.893	V	1.2
433	2017/04/13	15:48:29	2.397	A	4.8919	V	1.202778
434	2017/04/13	15:48:39	2.396	A	4.8907	V	1.205556
435	2017/04/13	15:48:49	2.396	A	4.8896	V	1.208333
436	2017/04/13	15:48:59	2.395	A	4.8885	V	1.211111
437	2017/04/13	15:49:09	2.396	A	4.8874	V	1.213889
438	2017/04/13	15:49:19	2.394	A	4.8864	V	1.216667
439	2017/04/13	15:49:29	2.396	A	4.8852	V	1.219444
440	2017/04/13	15:49:39	2.397	A	4.8842	V	1.222222
441	2017/04/13	15:49:49	2.396	A	4.8831	V	1.225
442	2017/04/13	15:49:59	2.396	A	4.926	V	1.227778
443	2017/04/13	15:50:09	2.396	A	4.9248	V	1.230556
444	2017/04/13	15:50:19	2.395	A	4.9236	V	1.233333
445	2017/04/13	15:50:29	2.395	A	4.9224	V	1.236111
446	2017/04/13	15:50:39	2.396	A	4.9212	V	1.238889
447	2017/04/13	15:50:49	2.396	A	4.92	V	1.241667
448	2017/04/13	15:50:59	2.396	A	4.9189	V	1.244444
449	2017/04/13	15:51:09	2.395	A	4.9177	V	1.247222
450	2017/04/13	15:51:19	2.395	A	4.9166	V	1.25
451	2017/04/13	15:51:29	2.396	A	4.9155	V	1.252778
452	2017/04/13	15:51:39	2.396	A	4.9144	V	1.255556
453	2017/04/13	15:51:49	2.395	A	4.9133	V	1.258333
454	2017/04/13	15:51:59	2.396	A	4.9122	V	1.261111
455	2017/04/13	15:52:09	2.394	A	4.9111	V	1.263889
456	2017/04/13	15:52:19	2.397	A	4.9101	V	1.266667
457	2017/04/13	15:52:29	2.397	A	4.909	V	1.269444
458	2017/04/13	15:52:39	2.395	A	4.908	V	1.272222
459	2017/04/13	15:52:49	2.396	A	4.9069	V	1.275
460	2017/04/13	15:52:59	2.397	A	4.9058	V	1.277778
461	2017/04/13	15:53:09	2.396	A	4.9048	V	1.280556
462	2017/04/13	15:53:19	2.396	A	4.9038	V	1.283333
463	2017/04/13	15:53:29	2.396	A	4.9029	V	1.286111
464	2017/04/13	15:53:39	2.395	A	4.9019	V	1.288889
465	2017/04/13	15:53:49	2.395	A	4.9009	V	1.291667
466	2017/04/13	15:53:59	2.396	A	4.8999	V	1.294444
467	2017/04/13	15:54:09	2.396	A	4.8989	V	1.297222
468	2017/04/13	15:54:19	2.396	A	4.8979	V	1.3
469	2017/04/13	15:54:29	2.396	A	4.8969	V	1.302778
470	2017/04/13	15:54:39	2.397	A	4.8959	V	1.305556
471	2017/04/13	15:54:49	2.395	A	4.895	V	1.308333
472	2017/04/13	15:54:59	2.396	A	4.894	V	1.311111
473	2017/04/13	15:55:09	2.395	A	4.8929	V	1.313889
474	2017/04/13	15:55:19	2.396	A	4.892	V	1.316667
475	2017/04/13	15:55:29	2.395	A	4.8911	V	1.319444
476	2017/04/13	15:55:39	2.396	A	4.8901	V	1.322222
477	2017/04/13	15:55:49	2.396	A	4.8891	V	1.325
478	2017/04/13	15:55:59	2.395	A	4.8883	V	1.327778
479	2017/04/13	15:56:09	2.396	A	4.8874	V	1.330556
480	2017/04/13	15:56:19	2.395	A	4.8864	V	1.333333
481	2017/04/13	15:56:29	2.395	A	4.8855	V	1.336111
482	2017/04/13	15:56:39	2.396	A	4.8845	V	1.338889
483	2017/04/13	15:56:49	2.396	A	4.8836	V	1.341667
484	2017/04/13	15:56:59	2.397	A	4.9271	V	1.344444
485	2017/04/13	15:57:09	2.396	A	4.926	V	1.347222
486	2017/04/13	15:57:19	2.396	A	4.9249	V	1.35
487	2017/04/13	15:57:29	2.395	A	4.9238	V	1.352778
488	2017/04/13	15:57:39	2.396	A	4.9227	V	1.355556
489	2017/04/13	15:57:49	2.396	A	4.9217	V	1.358333
490	2017/04/13	15:57:59	2.395	A	4.9208	V	1.361111
491	2017/04/13	15:58:09	2.395	A	4.9196	V	1.363889
492	2017/04/13	15:58:19	2.395	A	4.9187	V	1.366667
493	2017/04/13	15:58:29	2.396	A	4.9176	V	1.369444
494	2017/04/13	15:58:39	2.396	A	4.9168	V	1.372222
495	2017/04/13	15:58:49	2.396	A	4.9157	V	1.375
496	2017/04/13	15:58:59	2.397	A	4.9149	V	1.377778
497	2017/04/13	15:59:09	2.396	A	4.9139	V	1.380556
498	2017/04/13	15:59:19	2.396	A	4.9131	V	1.383333
499	2017/04/13	15:59:29	2.395	A	4.9122	V	1.386111
500	2017/04/13	15:59:39	2.396	A	4.9112	V	1.388889
501	2017/04/13	15:59:49	2.396	A	4.9103	V	1.391667
502	2017/04/13	15:59:59	2.397	A	4.9094	V	1.394444
503	2017/04/13	16:00:09	2.395	A	4.9085	V	1.397222
504	2017/04/13	16:00:19	2.395	A	4.9076	V	1.4
505	2017/04/13	16:00:29	2.396	A	4.9067	V	1.402778
506	2017/04/13	16:00:39	2.395	A	4.9058	V	1.405556
507	2017/04/13	16:00:49	2.396	A	4.905	V	1.408333
508	2017/04/13	16:00:59	2.396	A	4.9041	V	1.411111
509	2017/04/13	16:01:09	2.396	A	4.9033	V	1.413889
510	2017/04/13	16:01:19	2.395	A	4.9025	V	1.416667
511	2017/04/13	16:01:29	2.396	A	4.9016	V	1.419444
512	2017/04/13	16:01:39	2.396	A	4.9007	V	1.422222
513	2017/04/13	16:01:49	2.396	A	4.8999	V	1.425
514	2017/04/13	16:01:59	2.396	A	4.8991	V	1.427778
515	2017/04/13	16:02:09	2.396	A	4.8982	V	1.430556

516	2017/04/13	16:02:19	2.395	A	4.8973	V	1.433333
517	2017/04/13	16:02:29	2.396	A	4.8965	V	1.436111
518	2017/04/13	16:02:39	2.396	A	4.8957	V	1.438889
519	2017/04/13	16:02:49	2.396	A	4.8949	V	1.441667
520	2017/04/13	16:02:59	2.396	A	4.8941	V	1.444444
521	2017/04/13	16:03:09	2.396	A	4.8933	V	1.447222
522	2017/04/13	16:03:19	2.395	A	4.8925	V	1.45
523	2017/04/13	16:03:29	2.396	A	4.8916	V	1.452778
524	2017/04/13	16:03:39	2.395	A	4.8908	V	1.455556
525	2017/04/13	16:03:49	2.396	A	4.89	V	1.458333
526	2017/04/13	16:03:59	2.395	A	4.8892	V	1.461111
527	2017/04/13	16:04:09	2.395	A	4.8884	V	1.463889
528	2017/04/13	16:04:19	2.397	A	4.8876	V	1.466667
529	2017/04/13	16:04:29	2.396	A	4.8868	V	1.469444
530	2017/04/13	16:04:39	2.395	A	4.886	V	1.472222
531	2017/04/13	16:04:49	2.394	A	4.8852	V	1.475
532	2017/04/13	16:04:59	2.396	A	4.8844	V	1.477778
533	2017/04/13	16:05:09	2.396	A	4.8836	V	1.480556
534	2017/04/13	16:05:19	2.395	A	4.8828	V	1.483333
535	2017/04/13	16:05:29	2.395	A	4.9267	V	1.486111
536	2017/04/13	16:05:39	2.396	A	4.9257	V	1.488889
537	2017/04/13	16:05:49	2.396	A	4.9247	V	1.491667
538	2017/04/13	16:05:59	2.395	A	4.9236	V	1.494444
539	2017/04/13	16:06:09	2.395	A	4.9228	V	1.497222
540	2017/04/13	16:06:19	2.396	A	4.9218	V	1.5
541	2017/04/13	16:06:29	2.396	A	4.9209	V	1.502778
542	2017/04/13	16:06:39	2.396	A	4.9201	V	1.505556
543	2017/04/13	16:06:49	2.395	A	4.9192	V	1.508333
544	2017/04/13	16:06:59	2.396	A	4.9185	V	1.511111
545	2017/04/13	16:07:09	2.395	A	4.9177	V	1.513889
546	2017/04/13	16:07:19	2.396	A	4.9169	V	1.516667
547	2017/04/13	16:07:29	2.396	A	4.9159	V	1.519444
548	2017/04/13	16:07:39	2.395	A	4.9152	V	1.522222
549	2017/04/13	16:07:49	2.396	A	4.9144	V	1.525
550	2017/04/13	16:07:59	2.395	A	4.9135	V	1.527778
551	2017/04/13	16:08:09	2.395	A	4.9116	V	1.530556
552	2017/04/13	16:08:19	2.396	A	4.9111	V	1.533333
553	2017/04/13	16:08:29	2.396	A	4.9102	V	1.536111
554	2017/04/13	16:08:39	2.396	A	4.9094	V	1.538889
555	2017/04/13	16:08:49	2.396	A	4.9086	V	1.541667
556	2017/04/13	16:08:59	2.395	A	4.9078	V	1.544444
557	2017/04/13	16:09:09	2.396	A	4.907	V	1.547222
558	2017/04/13	16:09:19	2.396	A	4.9062	V	1.55
559	2017/04/13	16:09:29	2.396	A	4.9054	V	1.552778
560	2017/04/13	16:09:39	2.396	A	4.9046	V	1.555556
561	2017/04/13	16:09:49	2.395	A	4.9038	V	1.558333
562	2017/04/13	16:09:59	2.396	A	4.903	V	1.561111
563	2017/04/13	16:10:09	2.397	A	4.9022	V	1.563889
564	2017/04/13	16:10:19	2.397	A	4.9014	V	1.566667
565	2017/04/13	16:10:29	2.396	A	4.9006	V	1.569444
566	2017/04/13	16:10:39	2.396	A	4.8999	V	1.572222
567	2017/04/13	16:10:49	2.395	A	4.8995	V	1.575
568	2017/04/13	16:10:59	2.396	A	4.8991	V	1.577778
569	2017/04/13	16:11:09	2.396	A	4.8983	V	1.580556
570	2017/04/13	16:11:19	2.395	A	4.8976	V	1.583333
571	2017/04/13	16:11:29	2.396	A	4.8969	V	1.586111
572	2017/04/13	16:11:39	2.396	A	4.8961	V	1.588889
573	2017/04/13	16:11:49	2.394	A	4.8953	V	1.591667
574	2017/04/13	16:11:59	2.396	A	4.8945	V	1.594444
575	2017/04/13	16:12:09	2.395	A	4.8938	V	1.597222
576	2017/04/13	16:12:19	2.397	A	4.8925	V	1.6
577	2017/04/13	16:12:29	2.395	A	4.8918	V	1.602778
578	2017/04/13	16:12:39	2.396	A	4.8911	V	1.605556
579	2017/04/13	16:12:49	2.395	A	4.8903	V	1.608333
580	2017/04/13	16:12:59	2.396	A	4.8895	V	1.611111
581	2017/04/13	16:13:09	2.396	A	4.8891	V	1.613889
582	2017/04/13	16:13:19	2.395	A	4.8886	V	1.616667
583	2017/04/13	16:13:29	2.396	A	4.8878	V	1.619444
584	2017/04/13	16:13:39	2.395	A	4.887	V	1.622222
585	2017/04/13	16:13:49	2.397	A	4.8863	V	1.625
586	2017/04/13	16:13:59	2.395	A	4.8854	V	1.627778
587	2017/04/13	16:14:09	2.395	A	4.8847	V	1.630556
588	2017/04/13	16:14:19	2.396	A	4.8839	V	1.633333
589	2017/04/13	16:14:29	2.395	A	4.8832	V	1.636111
590	2017/04/13	16:14:39	2.396	A	4.8825	V	1.638889
591	2017/04/13	16:14:49	2.396	A	4.8817	V	1.641667
592	2017/04/13	16:14:59	2.395	A	4.8809	V	1.644444
593	2017/04/13	16:15:09	2.395	A	4.8801	V	1.647222
594	2017/04/13	16:15:19	2.396	A	4.8794	V	1.65
595	2017/04/13	16:15:29	2.396	A	4.8786	V	1.652778
596	2017/04/13	16:15:39	2.397	A	4.8779	V	1.655556
597	2017/04/13	16:15:49	2.396	A	4.8771	V	1.658333
598	2017/04/13	16:15:59	2.397	A	4.8763	V	1.661111
599	2017/04/13	16:16:09	2.396	A	4.8755	V	1.663889
600	2017/04/13	16:16:19	2.396	A	4.8748	V	1.666667
601	2017/04/13	16:16:29	2.395	A	4.8739	V	1.669444
602	2017/04/13	16:16:39	2.396	A	4.8731	V	1.672222

3rd Green Light Turns Off.

603	2017/04/13	16:16:49	2.396	A	4.8724	V	1.675
604	2017/04/13	16:16:59	2.396	A	4.8717	V	1.677778
605	2017/04/13	16:17:09	2.396	A	4.8709	V	1.680556
606	2017/04/13	16:17:19	2.396	A	4.8701	V	1.683333
607	2017/04/13	16:17:29	2.397	A	4.8694	V	1.686111
608	2017/04/13	16:17:39	2.395	A	4.8686	V	1.688889
609	2017/04/13	16:17:49	2.395	A	4.8678	V	1.691667
610	2017/04/13	16:17:59	2.396	A	4.8671	V	1.694444
611	2017/04/13	16:18:09	2.397	A	4.8663	V	1.697222
612	2017/04/13	16:18:19	2.396	A	4.8655	V	1.7
613	2017/04/13	16:18:29	2.396	A	4.8648	V	1.702778
614	2017/04/13	16:18:39	2.397	A	4.864	V	1.705556
615	2017/04/13	16:18:49	2.397	A	4.9082	V	1.708333
616	2017/04/13	16:18:59	2.397	A	4.9073	V	1.711111
617	2017/04/13	16:19:09	2.395	A	4.9062	V	1.713889
618	2017/04/13	16:19:19	2.396	A	4.9052	V	1.716667
619	2017/04/13	16:19:29	2.397	A	4.9043	V	1.719444
620	2017/04/13	16:19:39	2.396	A	4.9035	V	1.722222
621	2017/04/13	16:19:49	2.396	A	4.9026	V	1.725
622	2017/04/13	16:19:59	2.397	A	4.9018	V	1.727778
623	2017/04/13	16:20:09	2.397	A	4.9009	V	1.730556
624	2017/04/13	16:20:19	2.397	A	4.9001	V	1.733333
625	2017/04/13	16:20:29	2.396	A	4.8993	V	1.736111
626	2017/04/13	16:20:39	2.396	A	4.8985	V	1.738889
627	2017/04/13	16:20:49	2.397	A	4.8978	V	1.741667
628	2017/04/13	16:20:59	2.397	A	4.8969	V	1.744444
629	2017/04/13	16:21:09	2.397	A	4.896	V	1.747222
630	2017/04/13	16:21:19	2.396	A	4.8952	V	1.75
631	2017/04/13	16:21:29	2.396	A	4.8944	V	1.752778
632	2017/04/13	16:21:39	2.395	A	4.8937	V	1.755556
633	2017/04/13	16:21:49	2.395	A	4.8928	V	1.758333
634	2017/04/13	16:21:59	2.396	A	4.892	V	1.761111
635	2017/04/13	16:22:09	2.395	A	4.8911	V	1.763889
636	2017/04/13	16:22:19	2.396	A	4.8904	V	1.766667
637	2017/04/13	16:22:29	2.396	A	4.8896	V	1.769444
638	2017/04/13	16:22:39	2.396	A	4.8888	V	1.772222
639	2017/04/13	16:22:49	2.396	A	4.888	V	1.775
640	2017/04/13	16:22:59	2.396	A	4.8872	V	1.777778
641	2017/04/13	16:23:09	2.396	A	4.8864	V	1.780556
642	2017/04/13	16:23:19	2.396	A	4.8857	V	1.783333
643	2017/04/13	16:23:29	2.395	A	4.8849	V	1.786111
644	2017/04/13	16:23:39	2.396	A	4.884	V	1.788889
645	2017/04/13	16:23:49	2.396	A	4.8834	V	1.791667
646	2017/04/13	16:23:59	2.395	A	4.8825	V	1.794444
647	2017/04/13	16:24:09	2.396	A	4.8816	V	1.797222
648	2017/04/13	16:24:19	2.396	A	4.8809	V	1.8
649	2017/04/13	16:24:29	2.397	A	4.8801	V	1.802778
650	2017/04/13	16:24:39	2.397	A	4.8792	V	1.805556
651	2017/04/13	16:24:49	2.397	A	4.8783	V	1.808333
652	2017/04/13	16:24:59	2.395	A	4.8776	V	1.811111
653	2017/04/13	16:25:09	2.396	A	4.8768	V	1.813889
654	2017/04/13	16:25:19	2.396	A	4.8761	V	1.816667
655	2017/04/13	16:25:29	2.396	A	4.8752	V	1.819444
656	2017/04/13	16:25:39	2.395	A	4.8744	V	1.822222
657	2017/04/13	16:25:49	2.396	A	4.8737	V	1.825
658	2017/04/13	16:25:59	2.396	A	4.8729	V	1.827778
659	2017/04/13	16:26:09	2.397	A	4.8721	V	1.830556
660	2017/04/13	16:26:19	2.396	A	4.8713	V	1.833333
661	2017/04/13	16:26:29	2.396	A	4.8704	V	1.836111
662	2017/04/13	16:26:39	2.395	A	4.8697	V	1.838889
663	2017/04/13	16:26:49	2.395	A	4.8687	V	1.841667
664	2017/04/13	16:26:59	2.396	A	4.8672	V	1.844444
665	2017/04/13	16:27:09	2.396	A	4.8675	V	1.847222
666	2017/04/13	16:27:19	2.396	A	4.8669	V	1.85
667	2017/04/13	16:27:29	2.395	A	4.8659	V	1.852778
668	2017/04/13	16:27:39	2.397	A	4.8653	V	1.855556
669	2017/04/13	16:27:49	2.397	A	4.8646	V	1.858333
670	2017/04/13	16:27:59	2.397	A	4.8642	V	1.861111
671	2017/04/13	16:28:09	2.397	A	4.9088	V	1.863889
672	2017/04/13	16:28:19	2.396	A	4.908	V	1.866667
673	2017/04/13	16:28:29	2.396	A	4.9071	V	1.869444
674	2017/04/13	16:28:39	2.396	A	4.9063	V	1.872222
675	2017/04/13	16:28:49	2.396	A	4.9056	V	1.875
676	2017/04/13	16:28:59	2.396	A	4.9049	V	1.877778
677	2017/04/13	16:29:09	2.396	A	4.9042	V	1.880556
678	2017/04/13	16:29:19	2.394	A	4.9034	V	1.883333
679	2017/04/13	16:29:29	2.395	A	4.9026	V	1.886111
680	2017/04/13	16:29:39	2.396	A	4.9018	V	1.888889
681	2017/04/13	16:29:49	2.396	A	4.9011	V	1.891667
682	2017/04/13	16:29:59	2.396	A	4.9003	V	1.894444
683	2017/04/13	16:30:09	2.396	A	4.8996	V	1.897222
684	2017/04/13	16:30:19	2.396	A	4.8987	V	1.9
685	2017/04/13	16:30:29	2.396	A	4.898	V	1.902778
686	2017/04/13	16:30:39	2.396	A	4.8972	V	1.905556
687	2017/04/13	16:30:49	2.395	A	4.8963	V	1.908333
688	2017/04/13	16:30:59	2.396	A	4.8955	V	1.911111
689	2017/04/13	16:31:09	2.396	A	4.8947	V	1.913889

690	2017/04/13	16:31:19	2.396	A	4.8939	V	1.916667
691	2017/04/13	16:31:29	2.396	A	4.893	V	1.919444
692	2017/04/13	16:31:39	2.396	A	4.8923	V	1.922222
693	2017/04/13	16:31:49	2.396	A	4.8914	V	1.925
694	2017/04/13	16:31:59	2.396	A	4.891	V	1.927778
695	2017/04/13	16:32:09	2.397	A	4.8903	V	1.930556
696	2017/04/13	16:32:19	2.396	A	4.8894	V	1.933333
697	2017/04/13	16:32:29	2.396	A	4.8886	V	1.936111
698	2017/04/13	16:32:39	2.396	A	4.8878	V	1.938889
699	2017/04/13	16:32:49	2.397	A	4.8869	V	1.941667
700	2017/04/13	16:32:59	2.397	A	4.886	V	1.944444
701	2017/04/13	16:33:09	2.395	A	4.8851	V	1.947222
702	2017/04/13	16:33:19	2.396	A	4.8843	V	1.95
703	2017/04/13	16:33:29	2.396	A	4.8834	V	1.952778
704	2017/04/13	16:33:39	2.396	A	4.8826	V	1.955556
705	2017/04/13	16:33:49	2.396	A	4.8817	V	1.958333
706	2017/04/13	16:33:59	2.396	A	4.8807	V	1.961111
707	2017/04/13	16:34:09	2.397	A	4.8797	V	1.963889
708	2017/04/13	16:34:19	2.396	A	4.8789	V	1.966667
709	2017/04/13	16:34:29	2.397	A	4.8779	V	1.969444
710	2017/04/13	16:34:39	2.396	A	4.877	V	1.972222
711	2017/04/13	16:34:49	2.395	A	4.8761	V	1.975
712	2017/04/13	16:34:59	2.396	A	4.8751	V	1.977778
713	2017/04/13	16:35:09	2.396	A	4.8741	V	1.980556
714	2017/04/13	16:35:19	2.396	A	4.8732	V	1.983333
715	2017/04/13	16:35:29	2.395	A	4.8722	V	1.986111
716	2017/04/13	16:35:39	2.398	A	4.8712	V	1.988889
717	2017/04/13	16:35:49	2.396	A	4.8703	V	1.991667
718	2017/04/13	16:35:59	2.396	A	4.8693	V	1.994444
719	2017/04/13	16:36:09	2.396	A	4.8685	V	1.997222
720	2017/04/13	16:36:19	2.397	A	4.8675	V	2
721	2017/04/13	16:36:29	2.395	A	4.8664	V	2.002778
722	2017/04/13	16:36:39	2.396	A	4.8655	V	2.005556
723	2017/04/13	16:36:49	2.396	A	4.8645	V	2.008333
724	2017/04/13	16:36:59	2.395	A	4.9089	V	2.011111
725	2017/04/13	16:37:09	2.396	A	4.9077	V	2.013889
726	2017/04/13	16:37:19	2.397	A	4.9064	V	2.016667
727	2017/04/13	16:37:29	2.396	A	4.9054	V	2.019444
728	2017/04/13	16:37:39	2.396	A	4.9041	V	2.022222
729	2017/04/13	16:37:49	2.396	A	4.903	V	2.025
730	2017/04/13	16:37:59	2.397	A	4.9018	V	2.027778
731	2017/04/13	16:38:09	2.396	A	4.9007	V	2.030556
732	2017/04/13	16:38:19	2.397	A	4.8995	V	2.033333
733	2017/04/13	16:38:29	2.397	A	4.8985	V	2.036111
734	2017/04/13	16:38:39	2.396	A	4.8973	V	2.038889
735	2017/04/13	16:38:49	2.395	A	4.8964	V	2.041667
736	2017/04/13	16:38:59	2.396	A	4.8953	V	2.044444
737	2017/04/13	16:39:09	2.396	A	4.8942	V	2.047222
738	2017/04/13	16:39:19	2.396	A	4.8929	V	2.05
739	2017/04/13	16:39:29	2.396	A	4.8918	V	2.052778
740	2017/04/13	16:39:39	2.396	A	4.8908	V	2.055556
741	2017/04/13	16:39:49	2.396	A	4.8897	V	2.058333
742	2017/04/13	16:39:59	2.396	A	4.8887	V	2.061111
743	2017/04/13	16:40:09	2.398	A	4.8876	V	2.063889
744	2017/04/13	16:40:19	2.396	A	4.8865	V	2.066667
745	2017/04/13	16:40:29	2.396	A	4.8854	V	2.069444
746	2017/04/13	16:40:39	2.397	A	4.8844	V	2.072222
747	2017/04/13	16:40:49	2.396	A	4.8835	V	2.075
748	2017/04/13	16:40:59	2.395	A	4.8823	V	2.077778
749	2017/04/13	16:41:09	2.396	A	4.8811	V	2.080556
750	2017/04/13	16:41:19	2.396	A	4.8802	V	2.083333
751	2017/04/13	16:41:29	2.396	A	4.8792	V	2.086111
752	2017/04/13	16:41:39	2.396	A	4.8782	V	2.088889
753	2017/04/13	16:41:49	2.396	A	4.8771	V	2.091667
754	2017/04/13	16:41:59	2.395	A	4.8761	V	2.094444
755	2017/04/13	16:42:09	2.396	A	4.875	V	2.097222
756	2017/04/13	16:42:19	2.396	A	4.8739	V	2.1
757	2017/04/13	16:42:29	2.396	A	4.8729	V	2.102778
758	2017/04/13	16:42:39	2.396	A	4.8717	V	2.105556
759	2017/04/13	16:42:49	2.396	A	4.8706	V	2.108333
760	2017/04/13	16:42:59	2.396	A	4.8695	V	2.111111
761	2017/04/13	16:43:09	2.396	A	4.8685	V	2.113889
762	2017/04/13	16:43:19	2.396	A	4.8674	V	2.116667
763	2017/04/13	16:43:29	2.396	A	4.8663	V	2.119444
764	2017/04/13	16:43:39	2.395	A	4.8651	V	2.122222
765	2017/04/13	16:43:49	2.397	A	4.864	V	2.125
766	2017/04/13	16:43:59	2.397	A	4.9084	V	2.127778
767	2017/04/13	16:44:09	2.396	A	4.907	V	2.130556
768	2017/04/13	16:44:19	2.396	A	4.9057	V	2.133333
769	2017/04/13	16:44:29	2.397	A	4.9043	V	2.136111
770	2017/04/13	16:44:39	2.396	A	4.903	V	2.138889
771	2017/04/13	16:44:49	2.396	A	4.9017	V	2.141667
772	2017/04/13	16:44:59	2.396	A	4.9005	V	2.144444
773	2017/04/13	16:45:09	2.395	A	4.8993	V	2.147222
774	2017/04/13	16:45:19	2.396	A	4.8979	V	2.15
775	2017/04/13	16:45:29	2.395	A	4.8966	V	2.152778
776	2017/04/13	16:45:39	2.397	A	4.8954	V	2.155556

777	2017/04/13	16:45:49	2.395	A	4.8939	V	2.158333	
778	2017/04/13	16:45:59	2.396	A	4.8928	V	2.161111	
779	2017/04/13	16:46:09	2.398	A	4.8916	V	2.163889	2nd Green Light Turns Off.
780	2017/04/13	16:46:19	2.396	A	4.891	V	2.166667	
781	2017/04/13	16:46:29	2.395	A	4.8901	V	2.169444	
782	2017/04/13	16:46:39	2.397	A	4.8889	V	2.172222	
783	2017/04/13	16:46:49	2.397	A	4.8877	V	2.175	
784	2017/04/13	16:46:59	2.396	A	4.8867	V	2.177778	
785	2017/04/13	16:47:09	2.396	A	4.8854	V	2.180556	
786	2017/04/13	16:47:19	2.396	A	4.8841	V	2.183333	
787	2017/04/13	16:47:29	2.395	A	4.8829	V	2.186111	
788	2017/04/13	16:47:39	2.396	A	4.8816	V	2.188889	
789	2017/04/13	16:47:49	2.396	A	4.8806	V	2.191667	
790	2017/04/13	16:47:59	2.396	A	4.8792	V	2.194444	
791	2017/04/13	16:48:09	2.397	A	4.878	V	2.197222	
792	2017/04/13	16:48:19	2.396	A	4.8766	V	2.2	
793	2017/04/13	16:48:29	2.397	A	4.8754	V	2.202778	
794	2017/04/13	16:48:39	2.397	A	4.8743	V	2.205556	
795	2017/04/13	16:48:49	2.396	A	4.873	V	2.208333	
796	2017/04/13	16:48:59	2.396	A	4.8718	V	2.211111	
797	2017/04/13	16:49:09	2.395	A	4.8705	V	2.213889	
798	2017/04/13	16:49:19	2.396	A	4.8693	V	2.216667	
799	2017/04/13	16:49:29	2.397	A	4.8681	V	2.219444	
800	2017/04/13	16:49:39	2.397	A	4.8669	V	2.222222	
801	2017/04/13	16:49:49	2.395	A	4.8656	V	2.225	
802	2017/04/13	16:49:59	2.396	A	4.8644	V	2.227778	
803	2017/04/13	16 50:09	2.396	A	4.8631	V	2.230556	
804	2017/04/13	16 50:19	2.396	A	4.8618	V	2.233333	
805	2017/04/13	16 50:29	2.396	A	4.8605	V	2.236111	
806	2017/04/13	16 50:39	2.397	A	4.8593	V	2.238889	
807	2017/04/13	16 50:49	2.396	A	4.858	V	2.241667	
808	2017/04/13	16 50:59	2.395	A	4.8567	V	2.244444	
809	2017/04/13	16 51:09	2.396	A	4.8554	V	2.247222	
810	2017/04/13	16 51:19	2.396	A	4.8541	V	2.25	
811	2017/04/13	16 51:29	2.396	A	4.8528	V	2.252778	
812	2017/04/13	16 51:39	2.396	A	4.8516	V	2.255556	
813	2017/04/13	16 51:49	2.396	A	4.8502	V	2.258333	
814	2017/04/13	16 51:59	2.396	A	4.8489	V	2.261111	
815	2017/04/13	16 52:09	2.394	A	4.8476	V	2.263889	
816	2017/04/13	16 52:19	2.396	A	4.9378	V	2.266667	
817	2017/04/13	16 52:29	2.396	A	4.936	V	2.269444	
818	2017/04/13	16 52:39	2.397	A	4.934	V	2.272222	
819	2017/04/13	16 52:49	2.396	A	4.9322	V	2.275	
820	2017/04/13	16 52:59	2.397	A	4.9304	V	2.277778	
821	2017/04/13	16 53:09	2.396	A	4.9291	V	2.280556	
822	2017/04/13	16 53:19	2.396	A	4.9276	V	2.283333	
823	2017/04/13	16 53:29	2.397	A	4.9256	V	2.286111	
824	2017/04/13	16 53:39	2.397	A	4.9238	V	2.288889	
825	2017/04/13	16 53:49	2.396	A	4.9227	V	2.291667	
826	2017/04/13	16 53:59	2.396	A	4.9211	V	2.294444	
827	2017/04/13	16 54:09	2.395	A	4.9193	V	2.297222	
828	2017/04/13	16 54:19	2.396	A	4.9182	V	2.3	
829	2017/04/13	16 54:29	2.395	A	4.9163	V	2.302778	
830	2017/04/13	16 54:39	2.396	A	4.915	V	2.305556	
831	2017/04/13	16 54:49	2.396	A	4.9132	V	2.308333	
832	2017/04/13	16 54:59	2.396	A	4.9117	V	2.311111	
833	2017/04/13	16 55:09	2.396	A	4.9099	V	2.313889	
834	2017/04/13	16 55:19	2.395	A	4.9087	V	2.316667	
835	2017/04/13	16 55:29	2.396	A	4.9072	V	2.319444	
836	2017/04/13	16 55:39	2.396	A	4.9056	V	2.322222	
837	2017/04/13	16 55:49	2.395	A	4.9036	V	2.325	
838	2017/04/13	16 55:59	2.396	A	4.9025	V	2.327778	
839	2017/04/13	16 56:09	2.396	A	4.9009	V	2.330556	
840	2017/04/13	16 56:19	2.396	A	4.8987	V	2.333333	
841	2017/04/13	16 56:29	2.396	A	4.8977	V	2.336111	
842	2017/04/13	16 56:39	2.396	A	4.8962	V	2.338889	
843	2017/04/13	16 56:49	2.395	A	4.8941	V	2.341667	
844	2017/04/13	16 56:59	2.396	A	4.893	V	2.344444	
845	2017/04/13	16 57:09	2.395	A	4.8914	V	2.347222	
846	2017/04/13	16 57:19	2.396	A	4.8896	V	2.35	
847	2017/04/13	16 57:29	2.396	A	4.8879	V	2.352778	
848	2017/04/13	16 57:39	2.396	A	4.8864	V	2.355556	
849	2017/04/13	16 57:49	2.396	A	4.8846	V	2.358333	
850	2017/04/13	16 57:59	2.395	A	4.8826	V	2.361111	
851	2017/04/13	16 58:09	2.396	A	4.8814	V	2.363889	
852	2017/04/13	16 58:19	2.396	A	4.8795	V	2.366667	
853	2017/04/13	16 58:29	2.396	A	4.878	V	2.369444	
854	2017/04/13	16 58:39	2.396	A	4.8763	V	2.372222	
855	2017/04/13	16 58:49	2.396	A	4.8746	V	2.375	
856	2017/04/13	16 58:59	2.396	A	4.8726	V	2.377778	
857	2017/04/13	16 59:09	2.397	A	4.8711	V	2.380556	
858	2017/04/13	16 59:19	2.397	A	4.8692	V	2.383333	
859	2017/04/13	16 59:29	2.396	A	4.8677	V	2.386111	
860	2017/04/13	16 59:39	2.396	A	4.8657	V	2.388889	
861	2017/04/13	16 59:49	2.396	A	4.8637	V	2.391667	
862	2017/04/13	16 59:59	2.395	A	4.8625	V	2.394444	
863	2017/04/13	17 00:09	2.396	A	4.8606	V	2.397222	

864	2017/04/13	17 00:19	2.396	A	4.8587	V	2.4
865	2017/04/13	17 00:29	2.396	A	4.8568	V	2.402778
866	2017/04/13	17 00:39	2.398	A	4.8548	V	2.405556
867	2017/04/13	17 00:49	2.397	A	4.8533	V	2.408333
868	2017/04/13	17 00:59	2.395	A	4.8513	V	2.411111
869	2017/04/13	17 01:09	2.396	A	4.8494	V	2.413889
870	2017/04/13	17 01:19	2.396	A	4.8475	V	2.416667
871	2017/04/13	17 01:29	2.396	A	4.8456	V	2.419444
872	2017/04/13	17 01:39	2.395	A	4.9357	V	2.422222
873	2017/04/13	17 01:49	2.396	A	4.9333	V	2.425
874	2017/04/13	17 01:59	2.396	A	4.9302	V	2.427778
875	2017/04/13	17 02:09	2.396	A	4.9279	V	2.430556
876	2017/04/13	17 02:19	2.396	A	4.9258	V	2.433333
877	2017/04/13	17 02:29	2.395	A	4.9231	V	2.436111
878	2017/04/13	17 02:39	2.396	A	4.9209	V	2.438889
879	2017/04/13	17 02:49	2.395	A	4.9187	V	2.441667
880	2017/04/13	17 02:59	2.395	A	4.9164	V	2.444444
881	2017/04/13	17 03:09	2.395	A	4.9134	V	2.447222
882	2017/04/13	17 03:19	2.396	A	4.9119	V	2.45
883	2017/04/13	17 03:29	2.397	A	4.9091	V	2.452778
884	2017/04/13	17 03:39	2.397	A	4.9068	V	2.455556
885	2017/04/13	17 03:49	2.394	A	4.9044	V	2.458333
886	2017/04/13	17 03:59	2.396	A	4.9022	V	2.461111
887	2017/04/13	17 04:09	2.397	A	4.8999	V	2.463889
888	2017/04/13	17 04:19	2.396	A	4.8976	V	2.466667
889	2017/04/13	17 04:29	2.396	A	4.8948	V	2.469444
890	2017/04/13	17 04:39	2.397	A	4.8928	V	2.472222
891	2017/04/13	17 04:49	2.395	A	4.8899	V	2.475
892	2017/04/13	17 04:59	2.396	A	4.8871	V	2.477778
893	2017/04/13	17 05:09	2.396	A	4.8849	V	2.480556
894	2017/04/13	17 05:19	2.396	A	4.8825	V	2.483333
895	2017/04/13	17 05:29	2.395	A	4.8802	V	2.486111
896	2017/04/13	17 05:39	2.396	A	4.8772	V	2.488889
897	2017/04/13	17 05:49	2.395	A	4.8747	V	2.491667
898	2017/04/13	17 05:59	2.396	A	4.8724	V	2.494444
899	2017/04/13	17 06:09	2.397	A	4.8701	V	2.497222
900	2017/04/13	17 06:19	2.395	A	4.8671	V	2.5
901	2017/04/13	17 06:29	2.395	A	4.8647	V	2.502778
902	2017/04/13	17 06:39	2.395	A	4.8618	V	2.505556
903	2017/04/13	17 06:49	2.396	A	4.8594	V	2.508333
904	2017/04/13	17 06:59	2.395	A	4.8563	V	2.511111
905	2017/04/13	17 07:09	2.396	A	4.8541	V	2.513889
906	2017/04/13	17 07:19	2.396	A	4.8512	V	2.516667
907	2017/04/13	17 07:29	2.395	A	4.8481	V	2.519444
908	2017/04/13	17 07:39	2.395	A	4.9382	V	2.522222
909	2017/04/13	17 07:49	2.396	A	4.9341	V	2.525
910	2017/04/13	17 07:59	2.396	A	4.9305	V	2.527778
911	2017/04/13	17 08:09	2.396	A	4.9267	V	2.530556
912	2017/04/13	17 08:19	2.396	A	4.9231	V	2.533333
913	2017/04/13	17 08:29	2.398	A	4.9195	V	2.536111
914	2017/04/13	17 08:39	2.396	A	4.9161	V	2.538889
915	2017/04/13	17 08:49	2.396	A	4.9126	V	2.541667
916	2017/04/13	17 08:59	2.396	A	4.909	V	2.544444
917	2017/04/13	17 09:09	2.396	A	4.9053	V	2.547222
918	2017/04/13	17 09:19	2.396	A	4.9017	V	2.55
919	2017/04/13	17 09:29	2.396	A	4.8981	V	2.552778
920	2017/04/13	17 09:39	2.394	A	4.8947	V	2.555556
921	2017/04/13	17 09:49	2.396	A	4.8909	V	2.558333
922	2017/04/13	17 09:59	2.395	A	4.8878	V	2.561111
923	2017/04/13	17:10:09	2.396	A	4.8845	V	2.563889
924	2017/04/13	17:10:19	2.395	A	4.8808	V	2.566667
925	2017/04/13	17:10:29	2.397	A	4.8767	V	2.569444
926	2017/04/13	17:10:39	2.395	A	4.8731	V	2.572222
927	2017/04/13	17:10:49	2.395	A	4.8695	V	2.575
928	2017/04/13	17:10:59	2.396	A	4.8657	V	2.577778
929	2017/04/13	17:11:09	2.396	A	4.8615	V	2.580556
930	2017/04/13	17:11:19	2.396	A	4.8568	V	2.583333
931	2017/04/13	17:11:29	2.396	A	4.8528	V	2.586111
932	2017/04/13	17:11:39	2.396	A	4.9409	V	2.588889
933	2017/04/13	17:11:49	2.396	A	4.9353	V	2.591667
934	2017/04/13	17:11:59	2.396	A	4.9302	V	2.594444
935	2017/04/13	17:12:09	2.397	A	4.9247	V	2.597222
936	2017/04/13	17:12:19	2.395	A	4.9206	V	2.6
937	2017/04/13	17:12:29	2.395	A	4.9141	V	2.602778
938	2017/04/13	17:12:39	2.397	A	4.9092	V	2.605556
939	2017/04/13	17:12:49	2.396	A	4.9044	V	2.608333
940	2017/04/13	17:12:59	2.396	A	4.8981	V	2.611111
941	2017/04/13	17:13:09	2.395	A	4.8922	V	2.613889
942	2017/04/13	17:13:19	2.396	A	4.8879	V	2.616667
943	2017/04/13	17:13:29	2.396	A	4.8811	V	2.619444
944	2017/04/13	17:13:39	2.396	A	4.8758	V	2.622222
945	2017/04/13	17:13:49	2.396	A	4.8699	V	2.625
946	2017/04/13	17:13:59	2.397	A	4.8632	V	2.627778
947	2017/04/13	17:14:09	2.396	A	4.8588	V	2.630556
948	2017/04/13	17:14:19	2.397	A	4.8511	V	2.633333
949	2017/04/13	17:14:29	2.395	A	4.8446	V	2.636111
950	2017/04/13	17:14:39	2.396	A	4.8838	V	2.638889

1st Green Lite Starts Flashing.

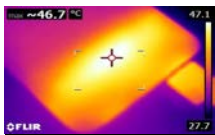
951	2017/04/13	17:14:49	2.396	A	4.8746	V	2.641667	
952	2017/04/13	17:14:59	2.395	A	4.8666	V	2.644444	
953	2017/04/13	17:15:09	2.396	A	4.8596	V	2.647222	
954	2017/04/13	17:15:19	2.396	A	4.8499	V	2.65	
955	2017/04/13	17:15:29	2.396	A	4.8909	V	2.652778	
956	2017/04/13	17:15:39	2.397	A	4.8783	V	2.655556	
957	2017/04/13	17:15:49	2.396	A	4.8667	V	2.658333	
958	2017/04/13	17:15:59	2.395	A	4.8584	V	2.661111	
959	2017/04/13	17:16:09	2.396	A	4.8464	V	2.663889	
960	2017/04/13	17:16:19	2.396	A	4.8789	V	2.666667	
961	2017/04/13	17:16:29	2.396	A	4.8677	V	2.669444	
962	2017/04/13	17:16:39	2.395	A	4.8527	V	2.672222	
963	2017/04/13	17:16:49	2.396	A	4.8847	V	2.675	1st Green Light Turns Off.
964	2017/04/13	17:16:59	2.396	A	4.8687	V	2.677778	
965	2017/04/13	17:17:09	2.396	A	4.886	V	2.680556	
966	2017/04/13	17:17:19	2.396	A	4.878	V	2.683333	
967	2017/04/13	17:17:29	2.395	A	4.855	V	2.686111	
968	2017/04/13	17:17:39	2.396	A	4.92	V	2.688889	
969	2017/04/13	17:17:49	0	A	0.4041	V	2.691667	0 % Charge.

WORM 2 CASE TEMPERATURES DURING DISCHARGING

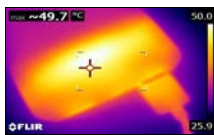
Start DisCharging.
All 4 Lights On.



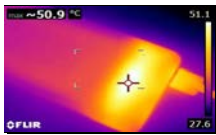
4th Light Off.



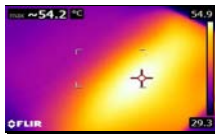
3rd Light Off.



2nd Light Off.



1st Light Flashing.

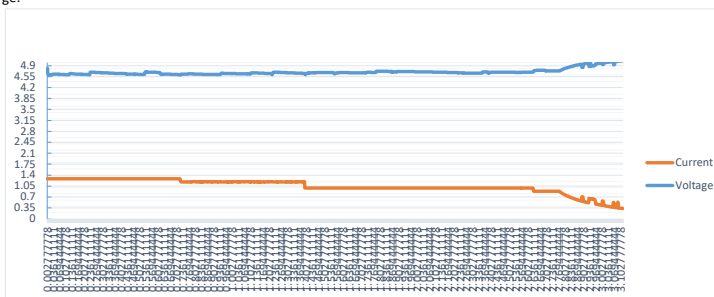


1st Light Off.



Title	Note 2014			Type	DCV_(020)	
Type	DCA_(181)					
MAX	1.284	A	06:27:20	MAX	5.0615	V 09:32:27
MIN	0.316	A	09:34:10	MIN	4.6009	V 06:27:17
AVG.	1.038	A		AVG.	4.7023	V

No	Date	Time	Value	Unit	Value	Unit	Time	Galaxy S7 Edge Charge Display
1	2017/04/12	06:25:50	1.283	A	4.819	V	0.002778	0% Charge.
2	2017/04/12	06:26:00	1.282	A	4.6302	V	0.005556	
3	2017/04/12	06:26:10	1.282	A	4.6107	V	0.008333	
4	2017/04/12	06:26:20	1.283	A	4.6107	V	0.011111	
5	2017/04/12	06:26:30	1.282	A	4.6079	V	0.013889	
6	2017/04/12	06:26:40	1.283	A	4.6061	V	0.016667	
7	2017/04/12	06:26:50	1.283	A	4.6059	V	0.019444	
8	2017/04/12	06:27:00	1.282	A	4.6065	V	0.022222	
9	2017/04/12	06:27:10	1.282	A	4.6024	V	0.025	
10	2017/04/12	06:27:20	1.284	A	4.6009	V	0.027778	
11	2017/04/12	06:27:30	1.282	A	4.6352	V	0.030556	
12	2017/04/12	06:27:40	1.283	A	4.6354	V	0.033333	
13	2017/04/12	06:27:50	1.281	A	4.635	V	0.036111	
14	2017/04/12	06:28:00	1.282	A	4.6342	V	0.038889	
15	2017/04/12	06:28:10	1.282	A	4.6335	V	0.041667	
16	2017/04/12	06:28:20	1.282	A	4.6326	V	0.044444	
17	2017/04/12	06:28:30	1.284	A	4.6316	V	0.047222	
18	2017/04/12	06:28:40	1.283	A	4.6306	V	0.05	
19	2017/04/12	06:28:50	1.283	A	4.6295	V	0.052778	
20	2017/04/12	06:29:00	1.283	A	4.6285	V	0.055556	
21	2017/04/12	06:29:10	1.283	A	4.6276	V	0.058333	
22	2017/04/12	06:29:20	1.282	A	4.6264	V	0.061111	
23	2017/04/12	06:29:30	1.283	A	4.6252	V	0.063889	
24	2017/04/12	06:29:40	1.282	A	4.6245	V	0.066667	
25	2017/04/12	06:29:50	1.284	A	4.6235	V	0.069444	
26	2017/04/12	06:30:00	1.283	A	4.6221	V	0.072222	5 % Charge.
27	2017/04/12	06:30:10	1.283	A	4.6209	V	0.075	
28	2017/04/12	06:30:20	1.283	A	4.6199	V	0.077778	
29	2017/04/12	06:30:30	1.283	A	4.6173	V	0.080556	
30	2017/04/12	06:30:40	1.281	A	4.6187	V	0.083333	
31	2017/04/12	06:30:50	1.282	A	4.6188	V	0.086111	
32	2017/04/12	06:31:00	1.282	A	4.6184	V	0.088889	
33	2017/04/12	06:31:10	1.283	A	4.6179	V	0.091667	
34	2017/04/12	06:31:20	1.283	A	4.6154	V	0.094444	
35	2017/04/12	06:31:30	1.281	A	4.6139	V	0.097222	
36	2017/04/12	06:31:40	1.283	A	4.6137	V	0.1	
37	2017/04/12	06:31:50	1.283	A	4.6133	V	0.102778	
38	2017/04/12	06:32:00	1.282	A	4.6129	V	0.105556	
39	2017/04/12	06:32:10	1.282	A	4.6122	V	0.108333	
40	2017/04/12	06:32:20	1.282	A	4.6114	V	0.111111	
41	2017/04/12	06:32:30	1.283	A	4.6108	V	0.113889	
42	2017/04/12	06:32:40	1.283	A	4.6099	V	0.116667	
43	2017/04/12	06:32:50	1.283	A	4.6061	V	0.119444	
44	2017/04/12	06:33:00	1.283	A	4.647	V	0.122222	
45	2017/04/12	06:33:10	1.283	A	4.6471	V	0.125	
46	2017/04/12	06:33:20	1.282	A	4.6467	V	0.127778	
47	2017/04/12	06:33:30	1.283	A	4.6462	V	0.130556	
48	2017/04/12	06:33:40	1.283	A	4.646	V	0.133333	
49	2017/04/12	06:33:50	1.283	A	4.646	V	0.136111	
50	2017/04/12	06:34:00	1.282	A	4.6455	V	0.138889	
51	2017/04/12	06:34:10	1.283	A	4.6448	V	0.141667	
52	2017/04/12	06:34:20	1.281	A	4.6441	V	0.144444	
53	2017/04/12	06:34:30	1.283	A	4.6345	V	0.147222	
54	2017/04/12	06:34:40	1.283	A	4.635	V	0.15	
55	2017/04/12	06:34:50	1.282	A	4.6347	V	0.152778	
56	2017/04/12	06:35:00	1.282	A	4.6342	V	0.155556	
57	2017/04/12	06:35:10	1.283	A	4.6335	V	0.158333	
58	2017/04/12	06:35:20	1.283	A	4.633	V	0.161111	
59	2017/04/12	06:35:30	1.282	A	4.6314	V	0.163889	
60	2017/04/12	06:35:40	1.284	A	4.6312	V	0.166667	
61	2017/04/12	06:35:50	1.282	A	4.6305	V	0.169444	
62	2017/04/12	06:36:00	1.283	A	4.6298	V	0.172222	
63	2017/04/12	06:36:10	1.281	A	4.6289	V	0.175	
64	2017/04/12	06:36:20	1.283	A	4.6283	V	0.177778	
65	2017/04/12	06:36:30	1.284	A	4.6274	V	0.180556	
66	2017/04/12	06:36:40	1.283	A	4.6268	V	0.183333	
67	2017/04/12	06:36:50	1.282	A	4.626	V	0.186111	
68	2017/04/12	06:37:00	1.282	A	4.6251	V	0.188889	
69	2017/04/12	06:37:10	1.284	A	4.6243	V	0.191667	
70	2017/04/12	06:37:20	1.283	A	4.6235	V	0.194444	
71	2017/04/12	06:37:30	1.282	A	4.6228	V	0.197222	
72	2017/04/12	06:37:40	1.282	A	4.6218	V	0.2	
73	2017/04/12	06:37:50	1.283	A	4.621	V	0.202778	
74	2017/04/12	06:38:00	1.283	A	4.6201	V	0.205556	
75	2017/04/12	06:38:10	1.283	A	4.6193	V	0.208333	
76	2017/04/12	06:38:20	1.282	A	4.6185	V	0.211111	
77	2017/04/12	06:38:30	1.283	A	4.6176	V	0.213889	
78	2017/04/12	06:38:40	1.283	A	4.6167	V	0.216667	
79	2017/04/12	06:38:50	1.282	A	4.6158	V	0.219444	
80	2017/04/12	06:39:00	1.282	A	4.6151	V	0.222222	
81	2017/04/12	06:39:10	1.283	A	4.6142	V	0.225	
82	2017/04/12	06:39:20	1.284	A	4.6135	V	0.227778	
83	2017/04/12	06:39:30	1.283	A	4.6127	V	0.230556	
84	2017/04/12	06:39:40	1.282	A	4.6946	V	0.233333	



Time to Completely Charge Galaxy S7 Edge is 3 Hours 6 Minutes 30 Seconds.
(Based on Galaxy S7 Edge Percent Charged Display Indicator Showing 100%.)

Time For Galaxy S7 Edge Charged Display Indicator to Show Stated Percentage.

TIME	% Charged	Accuracy is + 10 Seconds
4 Minutes 10 Seconds	5	
21 Minutes 20 Seconds	16	
36 Minutes 30 Seconds	26	
53 Minutes 20 Seconds	36	
1 Hour 13 Minutes 10 Seconds	49	
1 Hour 33 Minutes 10 Seconds	59	
1 Hour 53 Minutes 10 Seconds	69	
2 Hours 3 Minutes 10 Seconds	74	4th Green Light on Worm 2 Turned Off
2 Hours 13 Minutes 10 Seconds	79	
2 Hours 33 Minutes 10 Seconds	88	
2 Hours 55 Minutes 0 Seconds	99	
3 Hours 6 Minutes 30 Seconds	100	

85	2017/04/12	06:39:50	1.281	A	4.6938	V	0.236111
86	2017/04/12	06:40:00	1.282	A	4.6929	V	0.238889
87	2017/04/12	06:40:10	1.283	A	4.6921	V	0.241667
88	2017/04/12	06:40:20	1.283	A	4.6912	V	0.244444
89	2017/04/12	06:40:30	1.282	A	4.6902	V	0.247222
90	2017/04/12	06:40:40	1.282	A	4.6892	V	0.25
91	2017/04/12	06:40:50	1.282	A	4.6884	V	0.252778
92	2017/04/12	06:41:00	1.284	A	4.6875	V	0.255556
93	2017/04/12	06:41:10	1.283	A	4.6868	V	0.258333
94	2017/04/12	06:41:20	1.281	A	4.6858	V	0.261111
95	2017/04/12	06:41:30	1.283	A	4.6849	V	0.263889
96	2017/04/12	06:41:40	1.281	A	4.684	V	0.266667
97	2017/04/12	06:41:50	1.281	A	4.6832	V	0.269444
98	2017/04/12	06:42:00	1.283	A	4.6825	V	0.272222
99	2017/04/12	06:42:10	1.282	A	4.6817	V	0.275
100	2017/04/12	06:42:20	1.282	A	4.6809	V	0.277778
101	2017/04/12	06:42:30	1.281	A	4.68	V	0.280556
102	2017/04/12	06:42:40	1.283	A	4.6792	V	0.283333
103	2017/04/12	06:42:50	1.282	A	4.6785	V	0.286111
104	2017/04/12	06:43:00	1.282	A	4.6778	V	0.288889
105	2017/04/12	06:43:10	1.281	A	4.677	V	0.291667
106	2017/04/12	06:43:20	1.282	A	4.676	V	0.294444
107	2017/04/12	06:43:30	1.282	A	4.6754	V	0.297222
108	2017/04/12	06:43:40	1.282	A	4.6747	V	0.3
109	2017/04/12	06:43:50	1.282	A	4.674	V	0.302778
110	2017/04/12	06:44:00	1.282	A	4.6732	V	0.305556
111	2017/04/12	06:44:10	1.282	A	4.6724	V	0.308333
112	2017/04/12	06:44:20	1.281	A	4.6716	V	0.311111
113	2017/04/12	06:44:30	1.282	A	4.6709	V	0.313889
114	2017/04/12	06:44:40	1.281	A	4.6702	V	0.316667
115	2017/04/12	06:44:50	1.283	A	4.6695	V	0.319444
116	2017/04/12	06:45:00	1.282	A	4.6687	V	0.322222
117	2017/04/12	06:45:10	1.282	A	4.6679	V	0.325
118	2017/04/12	06:45:20	1.283	A	4.6672	V	0.327778
119	2017/04/12	06:45:30	1.282	A	4.6664	V	0.330556
120	2017/04/12	06:45:40	1.282	A	4.6658	V	0.333333
121	2017/04/12	06:45:50	1.281	A	4.665	V	0.336111
122	2017/04/12	06:46:00	1.282	A	4.6643	V	0.338889
123	2017/04/12	06:46:10	1.281	A	4.6634	V	0.341667
124	2017/04/12	06:46:20	1.284	A	4.6627	V	0.344444
125	2017/04/12	06:46:30	1.282	A	4.6622	V	0.347222
126	2017/04/12	06:46:40	1.283	A	4.6615	V	0.35
127	2017/04/12	06:46:50	1.283	A	4.6607	V	0.352778
128	2017/04/12	06:47:00	1.282	A	4.6599	V	0.355556
129	2017/04/12	06:47:10	1.282	A	4.6592	V	0.358333 16 % Charge.
130	2017/04/12	06:47:20	1.284	A	4.6566	V	0.361111
131	2017/04/12	06:47:30	1.282	A	4.6538	V	0.363889
132	2017/04/12	06:47:40	1.284	A	4.6552	V	0.366667
133	2017/04/12	06:47:50	1.282	A	4.6555	V	0.369444
134	2017/04/12	06:48:00	1.283	A	4.6554	V	0.372222
135	2017/04/12	06:48:10	1.282	A	4.6553	V	0.375
136	2017/04/12	06:48:20	1.284	A	4.6551	V	0.377778
137	2017/04/12	06:48:30	1.283	A	4.6549	V	0.380556
138	2017/04/12	06:48:40	1.283	A	4.6542	V	0.383333
139	2017/04/12	06:48:50	1.282	A	4.6539	V	0.386111
140	2017/04/12	06:49:00	1.282	A	4.6535	V	0.388889
141	2017/04/12	06:49:10	1.283	A	4.6531	V	0.391667
142	2017/04/12	06:49:20	1.283	A	4.6529	V	0.394444
143	2017/04/12	06:49:30	1.283	A	4.6524	V	0.397222
144	2017/04/12	06:49:40	1.282	A	4.652	V	0.4
145	2017/04/12	06:49:50	1.283	A	4.6516	V	0.402778
146	2017/04/12	06:50:00	1.282	A	4.6511	V	0.405556
147	2017/04/12	06:50:10	1.283	A	4.6507	V	0.408333
148	2017/04/12	06:50:20	1.281	A	4.6501	V	0.411111
149	2017/04/12	06:50:30	1.282	A	4.648	V	0.413889
150	2017/04/12	06:50:40	1.283	A	4.6511	V	0.416667
151	2017/04/12	06:50:50	1.283	A	4.6511	V	0.419444
152	2017/04/12	06:51:00	1.282	A	4.6357	V	0.422222
153	2017/04/12	06:51:10	1.283	A	4.6363	V	0.425
154	2017/04/12	06:51:20	1.282	A	4.6356	V	0.427778
155	2017/04/12	06:51:30	1.282	A	4.636	V	0.430556
156	2017/04/12	06:51:40	1.282	A	4.6356	V	0.433333
157	2017/04/12	06:51:50	1.282	A	4.6352	V	0.436111
158	2017/04/12	06:52:00	1.282	A	4.6349	V	0.438889
159	2017/04/12	06:52:10	1.282	A	4.6344	V	0.441667
160	2017/04/12	06:52:20	1.282	A	4.6341	V	0.444444
161	2017/04/12	06:52:30	1.283	A	4.6341	V	0.447222
162	2017/04/12	06:52:40	1.282	A	4.6337	V	0.45
163	2017/04/12	06:52:50	1.283	A	4.6332	V	0.452778
164	2017/04/12	06:53:00	1.282	A	4.6327	V	0.455556
165	2017/04/12	06:53:10	1.283	A	4.632	V	0.458333
166	2017/04/12	06:53:20	1.282	A	4.6314	V	0.461111
167	2017/04/12	06:53:30	1.283	A	4.6308	V	0.463889
168	2017/04/12	06:53:40	1.283	A	4.6301	V	0.466667
169	2017/04/12	06:53:50	1.282	A	4.6296	V	0.469444
170	2017/04/12	06:54:00	1.283	A	4.6386	V	0.472222
171	2017/04/12	06:54:10	1.282	A	4.6224	V	0.475
172	2017/04/12	06:54:20	1.282	A	4.6237	V	0.477778
173	2017/04/12	06:54:30	1.282	A	4.6257	V	0.480556
174	2017/04/12	06:54:40	1.282	A	4.6261	V	0.483333
175	2017/04/12	06:54:50	1.282	A	4.6262	V	0.486111

176	2017/04/12	06 55 00	1.282	A	4.626	V	0.488889
177	2017/04/12	06 55:10	1.283	A	4.6257	V	0.491667
178	2017/04/12	06 55:20	1.282	A	4.6253	V	0.494444
179	2017/04/12	06 55:30	1.284	A	4.6249	V	0.497222
180	2017/04/12	06 55:40	1.281	A	4.6245	V	0.5
181	2017/04/12	06 55 50	1.283	A	4.6237	V	0.502778
182	2017/04/12	06 56 00	1.282	A	4.6217	V	0.505556
183	2017/04/12	06 56:10	1.282	A	4.6218	V	0.508333
184	2017/04/12	06 56:20	1.282	A	4.6217	V	0.511111
185	2017/04/12	06 56:30	1.283	A	4.6213	V	0.513889
186	2017/04/12	06 56:40	1.284	A	4.6208	V	0.516667
187	2017/04/12	06 56 50	1.283	A	4.6209	V	0.519444
188	2017/04/12	06 57 00	1.282	A	4.6205	V	0.522222
189	2017/04/12	06 57:10	1.284	A	4.62	V	0.525
190	2017/04/12	06 57:20	1.282	A	4.6193	V	0.527778
191	2017/04/12	06 57:30	1.281	A	4.7036	V	0.530556
192	2017/04/12	06 57:40	1.282	A	4.7029	V	0.533333
193	2017/04/12	06 57 50	1.281	A	4.6973	V	0.536111
194	2017/04/12	06 58 00	1.282	A	4.697	V	0.538889
195	2017/04/12	06 58:10	1.282	A	4.6975	V	0.541667
196	2017/04/12	06 58:20	1.283	A	4.6974	V	0.544444
197	2017/04/12	06 58:30	1.282	A	4.6968	V	0.547222
198	2017/04/12	06 58:40	1.282	A	4.6961	V	0.55
199	2017/04/12	06 58 50	1.282	A	4.6953	V	0.552778
200	2017/04/12	06 59 00	1.281	A	4.6915	V	0.555556
201	2017/04/12	06 59:10	1.282	A	4.6912	V	0.558333
202	2017/04/12	06 59:20	1.282	A	4.6908	V	0.561111
203	2017/04/12	06 59:30	1.282	A	4.6883	V	0.563889
204	2017/04/12	06 59:40	1.281	A	4.6871	V	0.566667
205	2017/04/12	06 59 50	1.282	A	4.6891	V	0.569444
206	2017/04/12	07 00 00	1.281	A	4.6883	V	0.572222
207	2017/04/12	07 00:10	1.282	A	4.6891	V	0.575
208	2017/04/12	07 00:20	1.282	A	4.6889	V	0.577778
209	2017/04/12	07 00:30	1.282	A	4.6884	V	0.580556
210	2017/04/12	07 00:40	1.282	A	4.6879	V	0.583333
211	2017/04/12	07 00 50	1.282	A	4.6877	V	0.586111
212	2017/04/12	07 01 00	1.282	A	4.6874	V	0.588889
213	2017/04/12	07 01:10	1.281	A	4.6868	V	0.591667
214	2017/04/12	07 01:20	1.282	A	4.6858	V	0.594444
215	2017/04/12	07 01:30	1.282	A	4.685	V	0.597222
216	2017/04/12	07 01:40	1.283	A	4.6843	V	0.6
217	2017/04/12	07 01 50	1.281	A	4.6836	V	0.602778
218	2017/04/12	07 02 00	1.282	A	4.6819	V	0.605556
219	2017/04/12	07 02:10	1.283	A	4.6793	V	0.608333
220	2017/04/12	07 02:20	1.283	A	4.6784	V	0.611111 26 % Charge.
221	2017/04/12	07 02:30	1.281	A	4.6274	V	0.613889
222	2017/04/12	07 02:40	1.281	A	4.6322	V	0.616667
223	2017/04/12	07 02 50	1.283	A	4.6211	V	0.619444
224	2017/04/12	07 03 00	1.282	A	4.6242	V	0.622222
225	2017/04/12	07 03:10	1.283	A	4.6235	V	0.625
226	2017/04/12	07 03:20	1.283	A	4.6315	V	0.627778
227	2017/04/12	07 03:30	1.282	A	4.6286	V	0.630556
228	2017/04/12	07 03:40	1.282	A	4.6303	V	0.633333
229	2017/04/12	07 03 50	1.281	A	4.6304	V	0.636111
230	2017/04/12	07 04 00	1.283	A	4.6262	V	0.638889
231	2017/04/12	07 04:10	1.282	A	4.6292	V	0.641667
232	2017/04/12	07 04:20	1.282	A	4.6292	V	0.644444
233	2017/04/12	07 04:30	1.283	A	4.6292	V	0.647222
234	2017/04/12	07 04:40	1.283	A	4.6289	V	0.65
235	2017/04/12	07 04 50	1.283	A	4.6286	V	0.652778
236	2017/04/12	07 05 00	1.282	A	4.628	V	0.655556
237	2017/04/12	07 05:10	1.282	A	4.6276	V	0.658333
238	2017/04/12	07 05:20	1.282	A	4.627	V	0.661111
239	2017/04/12	07 05:30	1.283	A	4.6265	V	0.663889
240	2017/04/12	07 05:40	1.282	A	4.6257	V	0.666667
241	2017/04/12	07 05 50	1.283	A	4.6253	V	0.669444
242	2017/04/12	07 06 00	1.283	A	4.6249	V	0.672222
243	2017/04/12	07 06:10	1.282	A	4.6244	V	0.675
244	2017/04/12	07 06:20	1.282	A	4.6238	V	0.677778
245	2017/04/12	07 06:30	1.283	A	4.6233	V	0.680556
246	2017/04/12	07 06:40	1.282	A	4.6227	V	0.683333
247	2017/04/12	07 06 50	1.283	A	4.622	V	0.686111
248	2017/04/12	07 07 00	1.282	A	4.6214	V	0.688889
249	2017/04/12	07 07:10	1.283	A	4.6208	V	0.691667
250	2017/04/12	07 07:20	1.283	A	4.6202	V	0.694444
251	2017/04/12	07 07:30	1.282	A	4.6197	V	0.697222
252	2017/04/12	07 07:40	1.283	A	4.619	V	0.7
253	2017/04/12	07 07 50	1.284	A	4.6183	V	0.702778
254	2017/04/12	07 08 00	1.282	A	4.6174	V	0.705556
255	2017/04/12	07 08:10	1.283	A	4.6164	V	0.708333
256	2017/04/12	07 08:20	1.283	A	4.615	V	0.711111
257	2017/04/12	07 08:30	1.283	A	4.6147	V	0.713889
258	2017/04/12	07 08:40	1.282	A	4.6141	V	0.716667
259	2017/04/12	07 08 50	1.283	A	4.6134	V	0.719444
260	2017/04/12	07 09 00	1.186	A	4.6032	V	0.722222
261	2017/04/12	07 09:10	1.185	A	4.631	V	0.725
262	2017/04/12	07 09:20	1.185	A	4.6336	V	0.727778
263	2017/04/12	07 09:30	1.185	A	4.6345	V	0.730556
264	2017/04/12	07 09:40	1.185	A	4.6348	V	0.733333
265	2017/04/12	07 09 50	1.185	A	4.6347	V	0.736111
266	2017/04/12	07:10 00	1.185	A	4.6343	V	0.738889

267	2017/04/12	07:10:10	1.185	A	4.6341	V	0.741667
268	2017/04/12	07:10:20	1.185	A	4.6338	V	0.744444
269	2017/04/12	07:10:30	1.185	A	4.6334	V	0.747222
270	2017/04/12	07:10:40	1.184	A	4.633	V	0.75
271	2017/04/12	07:10:50	1.185	A	4.6331	V	0.752778
272	2017/04/12	07:11:00	1.186	A	4.6335	V	0.755556
273	2017/04/12	07:11:10	1.185	A	4.6335	V	0.758333
274	2017/04/12	07:11:20	1.185	A	4.6332	V	0.761111
275	2017/04/12	07:11:30	1.185	A	4.6357	V	0.763889
276	2017/04/12	07:11:40	1.184	A	4.6373	V	0.766667
277	2017/04/12	07:11:50	1.185	A	4.6382	V	0.769444
278	2017/04/12	07:12:00	1.185	A	4.6385	V	0.772222
279	2017/04/12	07:12:10	1.185	A	4.6377	V	0.775
280	2017/04/12	07:12:20	1.186	A	4.6375	V	0.777778
281	2017/04/12	07:12:30	1.185	A	4.6374	V	0.780556
282	2017/04/12	07:12:40	1.185	A	4.6358	V	0.783333
283	2017/04/12	07:12:50	1.187	A	4.6362	V	0.786111
284	2017/04/12	07:13:00	1.186	A	4.6362	V	0.788889
285	2017/04/12	07:13:10	1.186	A	4.6359	V	0.791667
286	2017/04/12	07:13:20	1.186	A	4.6356	V	0.794444
287	2017/04/12	07:13:30	1.186	A	4.6353	V	0.797222
288	2017/04/12	07:13:40	1.186	A	4.6347	V	0.8
289	2017/04/12	07:13:50	1.186	A	4.6343	V	0.802778
290	2017/04/12	07:14:00	1.185	A	4.6338	V	0.805556
291	2017/04/12	07:14:10	1.185	A	4.6332	V	0.808333
292	2017/04/12	07:14:20	1.186	A	4.6329	V	0.811111
293	2017/04/12	07:14:30	1.186	A	4.6323	V	0.813889
294	2017/04/12	07:14:40	1.185	A	4.632	V	0.816667
295	2017/04/12	07:14:50	1.187	A	4.6318	V	0.819444
296	2017/04/12	07:15:00	1.186	A	4.6311	V	0.822222
297	2017/04/12	07:15:10	1.185	A	4.6306	V	0.825
298	2017/04/12	07:15:20	1.186	A	4.6301	V	0.827778
299	2017/04/12	07:15:30	1.185	A	4.6295	V	0.830556
300	2017/04/12	07:15:40	1.185	A	4.629	V	0.833333
301	2017/04/12	07:15:50	1.186	A	4.6259	V	0.836111
302	2017/04/12	07:16:00	1.185	A	4.6256	V	0.838889
303	2017/04/12	07:16:10	1.186	A	4.6247	V	0.841667
304	2017/04/12	07:16:20	1.185	A	4.6242	V	0.844444
305	2017/04/12	07:16:30	1.186	A	4.6238	V	0.847222
306	2017/04/12	07:16:40	1.187	A	4.6235	V	0.85
307	2017/04/12	07:16:50	1.185	A	4.6225	V	0.852778
308	2017/04/12	07:17:00	1.186	A	4.6225	V	0.855556
309	2017/04/12	07:17:10	1.186	A	4.6224	V	0.858333
310	2017/04/12	07:17:20	1.186	A	4.6204	V	0.861111
311	2017/04/12	07:17:30	1.185	A	4.6189	V	0.863889
312	2017/04/12	07:17:40	1.186	A	4.6184	V	0.866667
313	2017/04/12	07:17:50	1.186	A	4.6191	V	0.869444
314	2017/04/12	07:18:00	1.185	A	4.6187	V	0.872222
315	2017/04/12	07:18:10	1.186	A	4.6194	V	0.875
316	2017/04/12	07:18:20	1.186	A	4.6202	V	0.877778
317	2017/04/12	07:18:30	1.186	A	4.6204	V	0.880556
318	2017/04/12	07:18:40	1.185	A	4.62	V	0.883333
319	2017/04/12	07:18:50	1.185	A	4.6198	V	0.886111
320	2017/04/12	07:19:00	1.185	A	4.6208	V	0.888889
321	2017/04/12	07:19:10	1.187	A	4.6203	V	0.891667 36 % Charge.
322	2017/04/12	07:19:20	1.185	A	4.6205	V	0.894444
323	2017/04/12	07:19:30	1.185	A	4.6202	V	0.897222
324	2017/04/12	07:19:40	1.186	A	4.6198	V	0.9
325	2017/04/12	07:19:50	1.186	A	4.6217	V	0.902778
326	2017/04/12	07:20:00	1.186	A	4.6188	V	0.905556
327	2017/04/12	07:20:10	1.185	A	4.6182	V	0.908333
328	2017/04/12	07:20:20	1.186	A	4.6176	V	0.911111
329	2017/04/12	07:20:30	1.186	A	4.617	V	0.913889
330	2017/04/12	07:20:40	1.186	A	4.6164	V	0.916667
331	2017/04/12	07:20:50	1.185	A	4.6159	V	0.919444
332	2017/04/12	07:21:00	1.186	A	4.6148	V	0.922222
333	2017/04/12	07:21:10	1.184	A	4.6154	V	0.925
334	2017/04/12	07:21:20	1.185	A	4.6153	V	0.927778
335	2017/04/12	07:21:30	1.185	A	4.6209	V	0.930556
336	2017/04/12	07:21:40	1.185	A	4.6212	V	0.933333
337	2017/04/12	07:21:50	1.187	A	4.6188	V	0.936111
338	2017/04/12	07:22:00	1.186	A	4.6185	V	0.938889
339	2017/04/12	07:22:10	1.185	A	4.6607	V	0.941667
340	2017/04/12	07:22:20	1.185	A	4.6602	V	0.944444
341	2017/04/12	07:22:30	1.185	A	4.6574	V	0.947222
342	2017/04/12	07:22:40	1.185	A	4.6579	V	0.95
343	2017/04/12	07:22:50	1.185	A	4.6577	V	0.952778
344	2017/04/12	07:23:00	1.185	A	4.6547	V	0.955556
345	2017/04/12	07:23:10	1.185	A	4.6539	V	0.958333
346	2017/04/12	07:23:20	1.185	A	4.6535	V	0.961111
347	2017/04/12	07:23:30	1.184	A	4.6532	V	0.963889
348	2017/04/12	07:23:40	1.185	A	4.6527	V	0.966667
349	2017/04/12	07:23:50	1.185	A	4.6524	V	0.969444
350	2017/04/12	07:24:00	1.186	A	4.6518	V	0.972222
351	2017/04/12	07:24:10	1.185	A	4.651	V	0.975
352	2017/04/12	07:24:20	1.186	A	4.6496	V	0.977778
353	2017/04/12	07:24:30	1.185	A	4.6492	V	0.980556
354	2017/04/12	07:24:40	1.186	A	4.6493	V	0.983333
355	2017/04/12	07:24:50	1.185	A	4.6493	V	0.986111
356	2017/04/12	07:25:00	1.185	A	4.6487	V	0.988889
357	2017/04/12	07:25:10	1.184	A	4.6482	V	0.991667

358	2017/04/12	07:25:20	1.185	A	4.6476	V	0.994444
359	2017/04/12	07:25:30	1.186	A	4.647	V	0.997222
360	2017/04/12	07:25:40	1.185	A	4.6445	V	1
361	2017/04/12	07:25:50	1.186	A	4.6473	V	1.002778
362	2017/04/12	07:26:00	1.184	A	4.6478	V	1.005556
363	2017/04/12	07:26:10	1.186	A	4.6475	V	1.008333
364	2017/04/12	07:26:20	1.186	A	4.6472	V	1.011111
365	2017/04/12	07:26:30	1.186	A	4.6468	V	1.013889
366	2017/04/12	07:26:40	1.186	A	4.6485	V	1.016667
367	2017/04/12	07:26:50	1.186	A	4.6449	V	1.019444
368	2017/04/12	07:27:00	1.186	A	4.6436	V	1.022222
369	2017/04/12	07:27:10	1.185	A	4.6431	V	1.025
370	2017/04/12	07:27:20	1.185	A	4.6429	V	1.027778
371	2017/04/12	07:27:30	1.186	A	4.6408	V	1.030556
372	2017/04/12	07:27:40	1.185	A	4.6411	V	1.033333
373	2017/04/12	07:27:50	1.187	A	4.6415	V	1.036111
374	2017/04/12	07:28:00	1.185	A	4.6426	V	1.038889
375	2017/04/12	07:28:10	1.185	A	4.6413	V	1.041667
376	2017/04/12	07:28:20	1.186	A	4.6409	V	1.044444
377	2017/04/12	07:28:30	1.185	A	4.6402	V	1.047222
378	2017/04/12	07:28:40	1.185	A	4.6415	V	1.05
379	2017/04/12	07:28:50	1.186	A	4.6403	V	1.052778
380	2017/04/12	07:29:00	1.186	A	4.6401	V	1.055556
381	2017/04/12	07:29:10	1.186	A	4.6378	V	1.058333
382	2017/04/12	07:29:20	1.186	A	4.6396	V	1.061111
383	2017/04/12	07:29:30	1.185	A	4.6388	V	1.063889
384	2017/04/12	07:29:40	1.185	A	4.6375	V	1.066667
385	2017/04/12	07:29:50	1.185	A	4.6366	V	1.069444
386	2017/04/12	07:30:00	1.186	A	4.637	V	1.072222
387	2017/04/12	07:30:10	1.186	A	4.6371	V	1.075
388	2017/04/12	07:30:20	1.187	A	4.6366	V	1.077778
389	2017/04/12	07:30:30	1.186	A	4.6358	V	1.080556
390	2017/04/12	07:30:40	1.186	A	4.6356	V	1.083333
391	2017/04/12	07:30:50	1.185	A	4.6381	V	1.086111
392	2017/04/12	07:31:00	1.186	A	4.6377	V	1.088889
393	2017/04/12	07:31:10	1.186	A	4.6365	V	1.091667
394	2017/04/12	07:31:20	1.185	A	4.636	V	1.094444
395	2017/04/12	07:31:30	1.186	A	4.6311	V	1.097222
396	2017/04/12	07:31:40	1.185	A	4.6315	V	1.1
397	2017/04/12	07:31:50	1.186	A	4.6748	V	1.102778
398	2017/04/12	07:32:00	1.185	A	4.6739	V	1.105556
399	2017/04/12	07:32:10	1.186	A	4.6734	V	1.108333
400	2017/04/12	07:32:20	1.186	A	4.6728	V	1.111111
401	2017/04/12	07:32:30	1.186	A	4.6724	V	1.113889
402	2017/04/12	07:32:40	1.185	A	4.6717	V	1.116667
403	2017/04/12	07:32:50	1.186	A	4.6711	V	1.119444
404	2017/04/12	07:33:00	1.184	A	4.6707	V	1.122222
405	2017/04/12	07:33:10	1.185	A	4.67	V	1.125
406	2017/04/12	07:33:20	1.185	A	4.6692	V	1.127778
407	2017/04/12	07:33:30	1.185	A	4.6687	V	1.130556
408	2017/04/12	07:33:40	1.185	A	4.6685	V	1.133333
409	2017/04/12	07:33:50	1.186	A	4.668	V	1.136111
410	2017/04/12	07:34:00	1.184	A	4.667	V	1.138889
411	2017/04/12	07:34:10	1.186	A	4.6662	V	1.141667
412	2017/04/12	07:34:20	1.185	A	4.6656	V	1.144444
413	2017/04/12	07:34:30	1.186	A	4.6649	V	1.147222
414	2017/04/12	07:34:40	1.185	A	4.6643	V	1.15
415	2017/04/12	07:34:50	1.185	A	4.6601	V	1.152778
416	2017/04/12	07:35:00	1.186	A	4.6604	V	1.155556
417	2017/04/12	07:35:10	1.185	A	4.6602	V	1.158333
418	2017/04/12	07:35:20	1.185	A	4.6596	V	1.161111
419	2017/04/12	07:35:30	1.184	A	4.6591	V	1.163889
420	2017/04/12	07:35:40	1.185	A	4.6587	V	1.166667
421	2017/04/12	07:35:50	1.185	A	4.6577	V	1.169444
422	2017/04/12	07:36:00	1.184	A	4.6567	V	1.172222
423	2017/04/12	07:36:10	1.186	A	4.6565	V	1.175
424	2017/04/12	07:36:20	1.185	A	4.6559	V	1.177778
425	2017/04/12	07:36:30	1.185	A	4.6552	V	1.180556
426	2017/04/12	07:36:40	1.185	A	4.6547	V	1.183333
427	2017/04/12	07:36:50	1.185	A	4.654	V	1.186111
428	2017/04/12	07:37:00	1.185	A	4.6535	V	1.188889
429	2017/04/12	07:37:10	1.186	A	4.6514	V	1.191667
430	2017/04/12	07:37:20	1.186	A	4.6498	V	1.194444
431	2017/04/12	07:37:30	1.184	A	4.65	V	1.197222
432	2017/04/12	07:37:40	1.184	A	4.6493	V	1.2
433	2017/04/12	07:37:50	1.185	A	4.6489	V	1.202778
434	2017/04/12	07:38:00	1.186	A	4.6486	V	1.205556
435	2017/04/12	07:38:10	1.186	A	4.648	V	1.208333
436	2017/04/12	07:38:20	1.186	A	4.6475	V	1.211111
437	2017/04/12	07:38:30	1.185	A	4.6469	V	1.213889
438	2017/04/12	07:38:40	1.186	A	4.6106	V	1.216667
439	2017/04/12	07:38:50	1.186	A	4.629	V	1.219444
440	2017/04/12	07:39:00	1.186	A	4.6831	V	1.222222 49 % Charge
441	2017/04/12	07:39:10	1.185	A	4.6886	V	1.225
442	2017/04/12	07:39:20	1.185	A	4.6892	V	1.227778
443	2017/04/12	07:39:30	1.185	A	4.6893	V	1.230556
444	2017/04/12	07:39:40	1.185	A	4.6893	V	1.233333
445	2017/04/12	07:39:50	1.184	A	4.6888	V	1.236111
446	2017/04/12	07:40:00	1.185	A	4.6885	V	1.238889
447	2017/04/12	07:40:10	1.186	A	4.6883	V	1.241667
448	2017/04/12	07:40:20	1.185	A	4.6876	V	1.244444

449	2017/04/12	07:40:30	1.186	A	4.6869	V	1.247222
450	2017/04/12	07:40:40	1.184	A	4.6863	V	1.25
451	2017/04/12	07:40:50	1.184	A	4.6858	V	1.252778
452	2017/04/12	07:41:00	1.185	A	4.6873	V	1.255556
453	2017/04/12	07:41:10	1.185	A	4.6874	V	1.258333
454	2017/04/12	07:41:20	1.184	A	4.6866	V	1.261111
455	2017/04/12	07:41:30	1.186	A	4.6857	V	1.263889
456	2017/04/12	07:41:40	1.186	A	4.6849	V	1.266667
457	2017/04/12	07:41:50	1.185	A	4.684	V	1.269444
458	2017/04/12	07:42:00	1.185	A	4.6825	V	1.272222
459	2017/04/12	07:42:10	1.185	A	4.6819	V	1.275
460	2017/04/12	07:42:20	1.185	A	4.6805	V	1.277778
461	2017/04/12	07:42:30	1.185	A	4.6797	V	1.280556
462	2017/04/12	07:42:40	1.185	A	4.6789	V	1.283333
463	2017/04/12	07:42:50	1.185	A	4.6782	V	1.286111
464	2017/04/12	07:43:00	1.185	A	4.6776	V	1.288889
465	2017/04/12	07:43:10	1.186	A	4.6771	V	1.291667
466	2017/04/12	07:43:20	1.185	A	4.6764	V	1.294444
467	2017/04/12	07:43:30	1.186	A	4.6757	V	1.297222
468	2017/04/12	07:43:40	1.185	A	4.6751	V	1.3
469	2017/04/12	07:43:50	1.185	A	4.6745	V	1.302778
470	2017/04/12	07:44:00	1.186	A	4.6738	V	1.305556
471	2017/04/12	07:44:10	1.185	A	4.673	V	1.308333
472	2017/04/12	07:44:20	1.185	A	4.6725	V	1.311111
473	2017/04/12	07:44:30	1.185	A	4.6718	V	1.313889
474	2017/04/12	07:44:40	1.186	A	4.6711	V	1.316667
475	2017/04/12	07:44:50	1.185	A	4.6704	V	1.319444
476	2017/04/12	07:45:00	1.186	A	4.6698	V	1.322222
477	2017/04/12	07:45:10	1.185	A	4.6692	V	1.325
478	2017/04/12	07:45:20	1.185	A	4.6686	V	1.327778
479	2017/04/12	07:45:30	1.185	A	4.668	V	1.330556
480	2017/04/12	07:45:40	1.185	A	4.6674	V	1.333333
481	2017/04/12	07:45:50	1.185	A	4.6669	V	1.336111
482	2017/04/12	07:46:00	1.183	A	4.6661	V	1.338889
483	2017/04/12	07:46:10	1.185	A	4.6655	V	1.341667
484	2017/04/12	07:46:20	1.186	A	4.6648	V	1.344444
485	2017/04/12	07:46:30	1.185	A	4.6642	V	1.347222
486	2017/04/12	07:46:40	1.186	A	4.6634	V	1.35
487	2017/04/12	07:46:50	1.185	A	4.6627	V	1.352778
488	2017/04/12	07:47:00	1.185	A	4.662	V	1.355556
489	2017/04/12	07:47:10	1.186	A	4.6612	V	1.358333
490	2017/04/12	07:47:20	1.186	A	4.6605	V	1.361111
491	2017/04/12	07:47:30	1.186	A	4.6597	V	1.363889
492	2017/04/12	07:47:40	1.185	A	4.659	V	1.366667
493	2017/04/12	07:47:50	1.185	A	4.6582	V	1.369444
494	2017/04/12	07:48:00	1.185	A	4.6575	V	1.372222
495	2017/04/12	07:48:10	1.185	A	4.6569	V	1.375
496	2017/04/12	07:48:20	1.185	A	4.6561	V	1.377778
497	2017/04/12	07:48:30	1.186	A	4.6554	V	1.380556
498	2017/04/12	07:48:40	1.186	A	4.6547	V	1.383333
499	2017/04/12	07:48:50	1.186	A	4.6539	V	1.386111
500	2017/04/12	07:49:00	1.186	A	4.6533	V	1.388889
501	2017/04/12	07:49:10	1.186	A	4.6526	V	1.391667
502	2017/04/12	07:49:20	0.984	A	4.652	V	1.394444
503	2017/04/12	07:49:30	0.985	A	4.6058	V	1.397222
504	2017/04/12	07:49:40	0.985	A	4.6258	V	1.4
505	2017/04/12	07:49:50	0.986	A	4.6463	V	1.402778
506	2017/04/12	07 50:00	0.985	A	4.6587	V	1.405556
507	2017/04/12	07 50:10	0.985	A	4.6597	V	1.408333
508	2017/04/12	07 50:20	0.986	A	4.6684	V	1.411111
509	2017/04/12	07 50:30	0.984	A	4.6508	V	1.413889
510	2017/04/12	07 50:40	0.984	A	4.6612	V	1.416667
511	2017/04/12	07 50:50	0.985	A	4.666	V	1.419444
512	2017/04/12	07 51:00	0.986	A	4.6687	V	1.422222
513	2017/04/12	07 51:10	0.985	A	4.6701	V	1.425
514	2017/04/12	07 51:20	0.985	A	4.67	V	1.427778
515	2017/04/12	07 51:30	0.985	A	4.6718	V	1.430556
516	2017/04/12	07 51:40	0.985	A	4.6748	V	1.433333
517	2017/04/12	07 51:50	0.985	A	4.6751	V	1.436111
518	2017/04/12	07 52:00	0.985	A	4.6751	V	1.438889
519	2017/04/12	07 52:10	0.986	A	4.6753	V	1.441667
520	2017/04/12	07 52:20	0.986	A	4.6776	V	1.444444
521	2017/04/12	07 52:30	0.985	A	4.6753	V	1.447222
522	2017/04/12	07 52:40	0.985	A	4.6754	V	1.45
523	2017/04/12	07 52:50	0.984	A	4.6764	V	1.452778
524	2017/04/12	07 53:00	0.986	A	4.6779	V	1.455556
525	2017/04/12	07 53:10	0.983	A	4.6794	V	1.458333
526	2017/04/12	07 53:20	0.984	A	4.6812	V	1.461111
527	2017/04/12	07 53:30	0.985	A	4.6819	V	1.463889
528	2017/04/12	07 53:40	0.985	A	4.6832	V	1.466667
529	2017/04/12	07 53:50	0.985	A	4.6838	V	1.469444
530	2017/04/12	07 54:00	0.986	A	4.684	V	1.472222
531	2017/04/12	07 54:10	0.985	A	4.6838	V	1.475
532	2017/04/12	07 54:20	0.984	A	4.6819	V	1.477778
533	2017/04/12	07 54:30	0.985	A	4.6837	V	1.480556
534	2017/04/12	07 54:40	0.983	A	4.6841	V	1.483333
535	2017/04/12	07 54:50	0.986	A	4.6841	V	1.486111
536	2017/04/12	07 55:00	0.984	A	4.6841	V	1.488889
537	2017/04/12	07 55:10	0.984	A	4.6843	V	1.491667
538	2017/04/12	07 55:20	0.985	A	4.6842	V	1.494444
539	2017/04/12	07 55:30	0.985	A	4.6828	V	1.497222

540	2017/04/12	07 55:40	0.985	A	4.683	V	1.5
541	2017/04/12	07 55 50	0.984	A	4.6833	V	1.502778
542	2017/04/12	07 56 00	0.985	A	4.6826	V	1.505556
543	2017/04/12	07 56:10	0.984	A	4.6827	V	1.508333
544	2017/04/12	07 56:20	0.985	A	4.6842	V	1.511111
545	2017/04/12	07 56:30	0.984	A	4.6843	V	1.513889
546	2017/04/12	07 56:40	0.986	A	4.6842	V	1.516667
547	2017/04/12	07 56 50	0.985	A	4.6842	V	1.519444
548	2017/04/12	07 57 00	0.985	A	4.6842	V	1.522222
549	2017/04/12	07 57:10	0.986	A	4.6839	V	1.525
550	2017/04/12	07 57:20	0.986	A	4.6836	V	1.527778
551	2017/04/12	07 57:30	0.986	A	4.6832	V	1.530556
552	2017/04/12	07 57:40	0.986	A	4.6823	V	1.533333
553	2017/04/12	07 57 50	0.985	A	4.68	V	1.536111
554	2017/04/12	07 58 00	0.985	A	4.6782	V	1.538889
555	2017/04/12	07 58:10	0.985	A	4.6782	V	1.541667
556	2017/04/12	07 58:20	0.986	A	4.6778	V	1.544444
557	2017/04/12	07 58:30	0.986	A	4.6771	V	1.547222
558	2017/04/12	07 58:40	0.986	A	4.6765	V	1.55
559	2017/04/12	07 58 50	0.985	A	4.6452	V	1.552778
560	2017/04/12	07 59 00	0.985	A	4.6408	V	1.555556 59 % Charge.
561	2017/04/12	07 59:10	0.984	A	4.6397	V	1.558333
562	2017/04/12	07 59:20	0.985	A	4.6577	V	1.561111
563	2017/04/12	07 59:30	0.984	A	4.669	V	1.563889
564	2017/04/12	07 59:40	0.986	A	4.6693	V	1.566667
565	2017/04/12	07 59 50	0.985	A	4.6667	V	1.569444
566	2017/04/12	08 00 00	0.984	A	4.6678	V	1.572222
567	2017/04/12	08 00:10	0.984	A	4.6737	V	1.575
568	2017/04/12	08 00:20	0.985	A	4.6757	V	1.577778
569	2017/04/12	08 00:30	0.984	A	4.6786	V	1.580556
570	2017/04/12	08 00:40	0.985	A	4.6792	V	1.583333
571	2017/04/12	08 00 50	0.986	A	4.6792	V	1.586111
572	2017/04/12	08 01 00	0.986	A	4.6801	V	1.588889
573	2017/04/12	08 01:10	0.984	A	4.6786	V	1.591667
574	2017/04/12	08 01:20	0.984	A	4.6799	V	1.594444
575	2017/04/12	08 01:30	0.985	A	4.6841	V	1.597222
576	2017/04/12	08 01:40	0.984	A	4.6855	V	1.6
577	2017/04/12	08 01 50	0.984	A	4.6843	V	1.602778
578	2017/04/12	08 02 00	0.986	A	4.684	V	1.605556
579	2017/04/12	08 02:10	0.984	A	4.6836	V	1.608333
580	2017/04/12	08 02:20	0.985	A	4.6842	V	1.611111
581	2017/04/12	08 02:30	0.984	A	4.6834	V	1.613889
582	2017/04/12	08 02:40	0.985	A	4.6821	V	1.616667
583	2017/04/12	08 02 50	0.985	A	4.681	V	1.619444
584	2017/04/12	08 03 00	0.986	A	4.6796	V	1.622222
585	2017/04/12	08 03:10	0.985	A	4.6798	V	1.625
586	2017/04/12	08 03:20	0.986	A	4.6807	V	1.627778
587	2017/04/12	08 03:30	0.985	A	4.6789	V	1.630556
588	2017/04/12	08 03:40	0.985	A	4.6764	V	1.633333
589	2017/04/12	08 03 50	0.986	A	4.6753	V	1.636111
590	2017/04/12	08 04 00	0.984	A	4.6752	V	1.638889
591	2017/04/12	08 04:10	0.985	A	4.6732	V	1.641667
592	2017/04/12	08 04:20	0.985	A	4.673	V	1.644444
593	2017/04/12	08 04:30	0.985	A	4.6726	V	1.647222
594	2017/04/12	08 04:40	0.984	A	4.6717	V	1.65
595	2017/04/12	08 04 50	0.984	A	4.6714	V	1.652778
596	2017/04/12	08 05 00	0.985	A	4.6693	V	1.655556
597	2017/04/12	08 05:10	0.985	A	4.6714	V	1.658333
598	2017/04/12	08 05:20	0.986	A	4.6727	V	1.661111
599	2017/04/12	08 05:30	0.985	A	4.6746	V	1.663889
600	2017/04/12	08 05:40	0.986	A	4.6739	V	1.666667
601	2017/04/12	08 05 50	0.985	A	4.6741	V	1.669444
602	2017/04/12	08 06 00	0.985	A	4.6734	V	1.672222
603	2017/04/12	08 06:10	0.986	A	4.6731	V	1.675
604	2017/04/12	08 06:20	0.985	A	4.6726	V	1.677778
605	2017/04/12	08 06:30	0.985	A	4.6722	V	1.680556
606	2017/04/12	08 06:40	0.986	A	4.672	V	1.683333
607	2017/04/12	08 06 50	0.985	A	4.6689	V	1.686111
608	2017/04/12	08 07 00	0.985	A	4.669	V	1.688889
609	2017/04/12	08 07:10	0.985	A	4.6694	V	1.691667
610	2017/04/12	08 07:20	0.985	A	4.6692	V	1.694444
611	2017/04/12	08 07:30	0.985	A	4.6688	V	1.697222
612	2017/04/12	08 07:40	0.985	A	4.6684	V	1.7
613	2017/04/12	08 07 50	0.985	A	4.6672	V	1.702778
614	2017/04/12	08 08 00	0.985	A	4.6671	V	1.705556
615	2017/04/12	08 08:10	0.985	A	4.6671	V	1.708333
616	2017/04/12	08 08:20	0.985	A	4.6672	V	1.711111
617	2017/04/12	08 08:30	0.984	A	4.667	V	1.713889
618	2017/04/12	08 08:40	0.986	A	4.6667	V	1.716667
619	2017/04/12	08 08 50	0.985	A	4.6666	V	1.719444
620	2017/04/12	08 09 00	0.984	A	4.6662	V	1.722222
621	2017/04/12	08 09:10	0.985	A	4.6842	V	1.725
622	2017/04/12	08 09:20	0.985	A	4.6863	V	1.727778
623	2017/04/12	08 09:30	0.984	A	4.6868	V	1.730556
624	2017/04/12	08 09:40	0.985	A	4.6871	V	1.733333
625	2017/04/12	08 09 50	0.985	A	4.6872	V	1.736111
626	2017/04/12	08:10 00	0.984	A	4.6872	V	1.738889
627	2017/04/12	08:10:10	0.985	A	4.6872	V	1.741667
628	2017/04/12	08:10:20	0.984	A	4.6872	V	1.744444
629	2017/04/12	08:10:30	0.984	A	4.6871	V	1.747222
630	2017/04/12	08:10:40	0.985	A	4.6869	V	1.75

631	2017/04/12	08:10:50	0.985	A	4.6864	V	1.752778
632	2017/04/12	08:11:00	0.985	A	4.686	V	1.755556
633	2017/04/12	08:11:10	0.984	A	4.6857	V	1.758333
634	2017/04/12	08:11:20	0.984	A	4.6855	V	1.761111
635	2017/04/12	08:11:30	0.985	A	4.6851	V	1.763889
636	2017/04/12	08:11:40	0.984	A	4.6847	V	1.766667
637	2017/04/12	08:11:50	0.985	A	4.6844	V	1.769444
638	2017/04/12	08:12:00	0.986	A	4.6844	V	1.772222
639	2017/04/12	08:12:10	0.984	A	4.6842	V	1.775
640	2017/04/12	08:12:20	0.984	A	4.6838	V	1.777778
641	2017/04/12	08:12:30	0.985	A	4.7276	V	1.780556
642	2017/04/12	08:12:40	0.985	A	4.7271	V	1.783333
643	2017/04/12	08:12:50	0.985	A	4.7267	V	1.786111
644	2017/04/12	08:13:00	0.985	A	4.7263	V	1.788889
645	2017/04/12	08:13:10	0.983	A	4.7259	V	1.791667
646	2017/04/12	08:13:20	0.985	A	4.7254	V	1.794444
647	2017/04/12	08:13:30	0.985	A	4.7249	V	1.797222
648	2017/04/12	08:13:40	0.983	A	4.7244	V	1.8
649	2017/04/12	08:13:50	0.984	A	4.724	V	1.802778
650	2017/04/12	08:14:00	0.985	A	4.7235	V	1.805556
651	2017/04/12	08:14:10	0.984	A	4.7231	V	1.808333
652	2017/04/12	08:14:20	0.984	A	4.7226	V	1.811111
653	2017/04/12	08:14:30	0.984	A	4.7221	V	1.813889
654	2017/04/12	08:14:40	0.984	A	4.7217	V	1.816667
655	2017/04/12	08:14:50	0.985	A	4.7212	V	1.819444
656	2017/04/12	08:15:00	0.985	A	4.7209	V	1.822222
657	2017/04/12	08:15:10	0.984	A	4.7205	V	1.825
658	2017/04/12	08:15:20	0.985	A	4.72	V	1.827778
659	2017/04/12	08:15:30	0.983	A	4.7197	V	1.830556
660	2017/04/12	08:15:40	0.984	A	4.7192	V	1.833333
661	2017/04/12	08:15:50	0.985	A	4.7188	V	1.836111
662	2017/04/12	08:16:00	0.985	A	4.7184	V	1.838889
663	2017/04/12	08:16:10	0.984	A	4.7179	V	1.841667
664	2017/04/12	08:16:20	0.984	A	4.7176	V	1.844444
665	2017/04/12	08:16:30	0.984	A	4.7174	V	1.847222
666	2017/04/12	08:16:40	0.984	A	4.7171	V	1.85
667	2017/04/12	08:16:50	0.984	A	4.7165	V	1.852778
668	2017/04/12	08:17:00	0.985	A	4.716	V	1.855556
669	2017/04/12	08:17:10	0.985	A	4.7155	V	1.858333
670	2017/04/12	08:17:20	0.985	A	4.7206	V	1.861111
671	2017/04/12	08:17:30	0.985	A	4.6866	V	1.863889
672	2017/04/12	08:17:40	0.985	A	4.704	V	1.866667
673	2017/04/12	08:17:50	0.985	A	4.7065	V	1.869444
674	2017/04/12	08:18:00	0.985	A	4.7073	V	1.872222
675	2017/04/12	08:18:10	0.985	A	4.707	V	1.875
676	2017/04/12	08:18:20	0.985	A	4.7069	V	1.877778
677	2017/04/12	08:18:30	0.984	A	4.7071	V	1.880556
678	2017/04/12	08:18:40	0.985	A	4.7069	V	1.883333
679	2017/04/12	08:18:50	0.985	A	4.7069	V	1.886111
680	2017/04/12	08:19:00	0.985	A	4.695	V	1.888889 69 % charge.
681	2017/04/12	08:19:10	0.985	A	4.7116	V	1.891667
682	2017/04/12	08:19:20	0.985	A	4.7137	V	1.894444
683	2017/04/12	08:19:30	0.985	A	4.7141	V	1.897222
684	2017/04/12	08:19:40	0.985	A	4.7143	V	1.9
685	2017/04/12	08:19:50	0.985	A	4.7143	V	1.902778
686	2017/04/12	08:20:00	0.984	A	4.7142	V	1.905556
687	2017/04/12	08:20:10	0.984	A	4.7141	V	1.908333
688	2017/04/12	08:20:20	0.985	A	4.7138	V	1.911111
689	2017/04/12	08:20:30	0.985	A	4.7136	V	1.913889
690	2017/04/12	08:20:40	0.985	A	4.7133	V	1.916667
691	2017/04/12	08:20:50	0.985	A	4.7135	V	1.919444
692	2017/04/12	08:21:00	0.985	A	4.7135	V	1.922222
693	2017/04/12	08:21:10	0.985	A	4.7133	V	1.925
694	2017/04/12	08:21:20	0.984	A	4.7131	V	1.927778
695	2017/04/12	08:21:30	0.986	A	4.713	V	1.930556
696	2017/04/12	08:21:40	0.986	A	4.713	V	1.933333
697	2017/04/12	08:21:50	0.985	A	4.7127	V	1.936111
698	2017/04/12	08:22:00	0.985	A	4.7125	V	1.938889
699	2017/04/12	08:22:10	0.985	A	4.7122	V	1.941667
700	2017/04/12	08:22:20	0.985	A	4.7119	V	1.944444
701	2017/04/12	08:22:30	0.984	A	4.7115	V	1.947222
702	2017/04/12	08:22:40	0.984	A	4.7112	V	1.95
703	2017/04/12	08:22:50	0.985	A	4.7109	V	1.952778
704	2017/04/12	08:23:00	0.985	A	4.7105	V	1.955556
705	2017/04/12	08:23:10	0.985	A	4.7103	V	1.958333
706	2017/04/12	08:23:20	0.985	A	4.71	V	1.961111
707	2017/04/12	08:23:30	0.985	A	4.7096	V	1.963889
708	2017/04/12	08:23:40	0.985	A	4.7093	V	1.966667
709	2017/04/12	08:23:50	0.985	A	4.7089	V	1.969444
710	2017/04/12	08:24:00	0.984	A	4.7088	V	1.972222
711	2017/04/12	08:24:10	0.984	A	4.7086	V	1.975
712	2017/04/12	08:24:20	0.985	A	4.7085	V	1.977778
713	2017/04/12	08:24:30	0.984	A	4.7081	V	1.980556
714	2017/04/12	08:24:40	0.985	A	4.7078	V	1.983333
715	2017/04/12	08:24:50	0.985	A	4.7074	V	1.986111
716	2017/04/12	08:25:00	0.985	A	4.7071	V	1.988889
717	2017/04/12	08:25:10	0.984	A	4.7067	V	1.991667
718	2017/04/12	08:25:20	0.985	A	4.7064	V	1.994444
719	2017/04/12	08:25:30	0.985	A	4.7062	V	1.997222
720	2017/04/12	08:25:40	0.985	A	4.706	V	2
721	2017/04/12	08:25:50	0.985	A	4.7056	V	2.002778

722	2017/04/12	08:26:00	0.985	A	4.7053	V	2.005556
723	2017/04/12	08:26:10	0.985	A	4.705	V	2.008333
724	2017/04/12	08:26:20	0.985	A	4.7046	V	2.011111
725	2017/04/12	08:26:30	0.985	A	4.7042	V	2.013889
726	2017/04/12	08:26:40	0.985	A	4.7038	V	2.016667
727	2017/04/12	08:26:50	0.984	A	4.7033	V	2.019444
728	2017/04/12	08:27:00	0.985	A	4.703	V	2.022222
729	2017/04/12	08:27:10	0.985	A	4.7026	V	2.025
730	2017/04/12	08:27:20	0.986	A	4.7022	V	2.027778
731	2017/04/12	08:27:30	0.984	A	4.7018	V	2.030556
732	2017/04/12	08:27:40	0.984	A	4.7015	V	2.033333
733	2017/04/12	08:27:50	0.984	A	4.701	V	2.036111
734	2017/04/12	08:28:00	0.985	A	4.7006	V	2.038889
735	2017/04/12	08:28:10	0.985	A	4.7003	V	2.041667
736	2017/04/12	08:28:20	0.985	A	4.7001	V	2.044444
737	2017/04/12	08:28:30	0.984	A	4.7	V	2.047222
738	2017/04/12	08:28:40	0.983	A	4.6999	V	2.05
739	2017/04/12	08:28:50	0.984	A	4.6997	V	2.052778
740	2017/04/12	08:29:00	0.985	A	4.6995	V	2.055556 4th Green Light On Worm 2 Turns Off.
741	2017/04/12	08:29:10	0.985	A	4.6994	V	2.058333
742	2017/04/12	08:29:20	0.984	A	4.6993	V	2.061111
743	2017/04/12	08:29:30	0.984	A	4.699	V	2.063889
744	2017/04/12	08:29:40	0.986	A	4.6988	V	2.066667
745	2017/04/12	08:29:50	0.985	A	4.6985	V	2.069444
746	2017/04/12	08:30:00	0.985	A	4.6982	V	2.072222
747	2017/04/12	08:30:10	0.984	A	4.6979	V	2.075
748	2017/04/12	08:30:20	0.985	A	4.6978	V	2.077778
749	2017/04/12	08:30:30	0.985	A	4.6975	V	2.080556
750	2017/04/12	08:30:40	0.985	A	4.6971	V	2.083333
751	2017/04/12	08:30:50	0.984	A	4.6968	V	2.086111
752	2017/04/12	08:31:00	0.984	A	4.6965	V	2.088889
753	2017/04/12	08:31:10	0.985	A	4.6962	V	2.091667
754	2017/04/12	08:31:20	0.985	A	4.6959	V	2.094444
755	2017/04/12	08:31:30	0.985	A	4.6957	V	2.097222
756	2017/04/12	08:31:40	0.985	A	4.6953	V	2.1
757	2017/04/12	08:31:50	0.986	A	4.6948	V	2.102778
758	2017/04/12	08:32:00	0.985	A	4.6896	V	2.105556
759	2017/04/12	08:32:10	0.984	A	4.691	V	2.108333
760	2017/04/12	08:32:20	0.984	A	4.6915	V	2.111111
761	2017/04/12	08:32:30	0.985	A	4.6916	V	2.113889
762	2017/04/12	08:32:40	0.986	A	4.6915	V	2.116667
763	2017/04/12	08:32:50	0.985	A	4.6914	V	2.119444
764	2017/04/12	08:33:00	0.985	A	4.6913	V	2.122222
765	2017/04/12	08:33:10	0.984	A	4.6909	V	2.125
766	2017/04/12	08:33:20	0.985	A	4.6906	V	2.127778
767	2017/04/12	08:33:30	0.985	A	4.6903	V	2.130556
768	2017/04/12	08:33:40	0.985	A	4.6899	V	2.133333
769	2017/04/12	08:33:50	0.985	A	4.6897	V	2.136111
770	2017/04/12	08:34:00	0.985	A	4.6892	V	2.138889
771	2017/04/12	08:34:10	0.986	A	4.689	V	2.141667
772	2017/04/12	08:34:20	0.985	A	4.6886	V	2.144444
773	2017/04/12	08:34:30	0.985	A	4.6884	V	2.147222
774	2017/04/12	08:34:40	0.985	A	4.6882	V	2.15
775	2017/04/12	08:34:50	0.985	A	4.6879	V	2.152778
776	2017/04/12	08:35:00	0.985	A	4.6876	V	2.155556
777	2017/04/12	08:35:10	0.985	A	4.6872	V	2.158333
778	2017/04/12	08:35:20	0.986	A	4.6868	V	2.161111
779	2017/04/12	08:35:30	0.985	A	4.6865	V	2.163889
780	2017/04/12	08:35:40	0.985	A	4.6861	V	2.166667
781	2017/04/12	08:35:50	0.986	A	4.6858	V	2.169444
782	2017/04/12	08:36:00	0.985	A	4.6855	V	2.172222
783	2017/04/12	08:36:10	0.984	A	4.6851	V	2.175
784	2017/04/12	08:36:20	0.984	A	4.6847	V	2.177778
785	2017/04/12	08:36:30	0.984	A	4.6844	V	2.180556
786	2017/04/12	08:36:40	0.985	A	4.6841	V	2.183333
787	2017/04/12	08:36:50	0.985	A	4.6837	V	2.186111
788	2017/04/12	08:37:00	0.985	A	4.6833	V	2.188889
789	2017/04/12	08:37:10	0.985	A	4.683	V	2.191667
790	2017/04/12	08:37:20	0.985	A	4.6826	V	2.194444
791	2017/04/12	08:37:30	0.984	A	4.6822	V	2.197222
792	2017/04/12	08:37:40	0.985	A	4.682	V	2.2
793	2017/04/12	08:37:50	0.985	A	4.6815	V	2.202778
794	2017/04/12	08:38:00	0.985	A	4.6811	V	2.205556
795	2017/04/12	08:38:10	0.984	A	4.6806	V	2.208333
796	2017/04/12	08:38:20	0.985	A	4.6804	V	2.211111
797	2017/04/12	08:38:30	0.984	A	4.6803	V	2.213889
798	2017/04/12	08:38:40	0.985	A	4.6798	V	2.216667
799	2017/04/12	08:38:50	0.984	A	4.6792	V	2.219444
800	2017/04/12	08:39:00	0.985	A	4.6595	V	2.222222
801	2017/04/12	08:39:10	0.984	A	4.6657	V	2.225
802	2017/04/12	08:39:20	0.984	A	4.6669	V	2.227778
803	2017/04/12	08:39:30	0.985	A	4.6673	V	2.230556
804	2017/04/12	08:39:40	0.985	A	4.6674	V	2.233333
805	2017/04/12	08:39:50	0.985	A	4.6673	V	2.236111 79 % Charge.
806	2017/04/12	08:40:00	0.985	A	4.6672	V	2.238889
807	2017/04/12	08:40:10	0.985	A	4.6672	V	2.241667
808	2017/04/12	08:40:20	0.984	A	4.667	V	2.244444
809	2017/04/12	08:40:30	0.985	A	4.6669	V	2.247222
810	2017/04/12	08:40:40	0.986	A	4.6666	V	2.25
811	2017/04/12	08:40:50	0.985	A	4.6663	V	2.252778
812	2017/04/12	08:41:00	0.984	A	4.6662	V	2.255556

813	2017/04/12	08:41:10	0.985	A	4.6663	V	2.258333
814	2017/04/12	08:41:20	0.984	A	4.6662	V	2.261111
815	2017/04/12	08:41:30	0.985	A	4.666	V	2.263889
816	2017/04/12	08:41:40	0.985	A	4.6657	V	2.266667
817	2017/04/12	08:41:50	0.986	A	4.6655	V	2.269444
818	2017/04/12	08:42:00	0.985	A	4.6653	V	2.272222
819	2017/04/12	08:42:10	0.984	A	4.665	V	2.275
820	2017/04/12	08:42:20	0.986	A	4.6647	V	2.277778
821	2017/04/12	08:42:30	0.984	A	4.6645	V	2.280556
822	2017/04/12	08:42:40	0.984	A	4.6643	V	2.283333
823	2017/04/12	08:42:50	0.985	A	4.664	V	2.286111
824	2017/04/12	08:43:00	0.985	A	4.6637	V	2.288889
825	2017/04/12	08:43:10	0.985	A	4.6634	V	2.291667
826	2017/04/12	08:43:20	0.985	A	4.6631	V	2.294444
827	2017/04/12	08:43:30	0.986	A	4.6628	V	2.297222
828	2017/04/12	08:43:40	0.984	A	4.6625	V	2.3
829	2017/04/12	08:43:50	0.985	A	4.6621	V	2.302778
830	2017/04/12	08:44:00	0.985	A	4.6618	V	2.305556
831	2017/04/12	08:44:10	0.985	A	4.6615	V	2.308333
832	2017/04/12	08:44:20	0.985	A	4.6611	V	2.311111
833	2017/04/12	08:44:30	0.984	A	4.6607	V	2.313889
834	2017/04/12	08:44:40	0.986	A	4.6604	V	2.316667
835	2017/04/12	08:44:50	0.985	A	4.6601	V	2.319444
836	2017/04/12	08:45:00	0.985	A	4.6598	V	2.322222
837	2017/04/12	08:45:10	0.985	A	4.6595	V	2.325
838	2017/04/12	08:45:20	0.986	A	4.6594	V	2.327778
839	2017/04/12	08:45:30	0.986	A	4.6595	V	2.330556
840	2017/04/12	08:45:40	0.985	A	4.6595	V	2.333333
841	2017/04/12	08:45:50	0.984	A	4.6594	V	2.336111
842	2017/04/12	08:46:00	0.986	A	4.6592	V	2.338889
843	2017/04/12	08:46:10	0.984	A	4.6589	V	2.341667
844	2017/04/12	08:46:20	0.985	A	4.6587	V	2.344444
845	2017/04/12	08:46:30	0.986	A	4.6584	V	2.347222
846	2017/04/12	08:46:40	0.985	A	4.6581	V	2.35
847	2017/04/12	08:46:50	0.985	A	4.658	V	2.352778
848	2017/04/12	08:47:00	0.986	A	4.7025	V	2.355556
849	2017/04/12	08:47:10	0.985	A	4.702	V	2.358333
850	2017/04/12	08:47:20	0.985	A	4.7016	V	2.361111
851	2017/04/12	08:47:30	0.985	A	4.7013	V	2.363889
852	2017/04/12	08:47:40	0.985	A	4.701	V	2.366667
853	2017/04/12	08:47:50	0.984	A	4.7008	V	2.369444
854	2017/04/12	08:48:00	0.984	A	4.7006	V	2.372222
855	2017/04/12	08:48:10	0.984	A	4.7001	V	2.375
856	2017/04/12	08:48:20	0.984	A	4.6998	V	2.377778
857	2017/04/12	08:48:30	0.984	A	4.6996	V	2.380556
858	2017/04/12	08:48:40	0.985	A	4.6992	V	2.383333
859	2017/04/12	08:48:50	0.985	A	4.647	V	2.386111
860	2017/04/12	08:49:00	0.985	A	4.6602	V	2.388889
861	2017/04/12	08:49:10	0.985	A	4.6832	V	2.391667
862	2017/04/12	08:49:20	0.984	A	4.676	V	2.394444
863	2017/04/12	08:49:30	0.985	A	4.6924	V	2.397222
864	2017/04/12	08:49:40	0.984	A	4.6934	V	2.4
865	2017/04/12	08:49:50	0.985	A	4.6941	V	2.402778
866	2017/04/12	08:50:00	0.985	A	4.6946	V	2.405556
867	2017/04/12	08:50:10	0.984	A	4.6948	V	2.408333
868	2017/04/12	08:50:20	0.984	A	4.6949	V	2.411111
869	2017/04/12	08:50:30	0.985	A	4.695	V	2.413889
870	2017/04/12	08:50:40	0.985	A	4.6951	V	2.416667
871	2017/04/12	08:50:50	0.984	A	4.695	V	2.419444
872	2017/04/12	08:51:00	0.984	A	4.695	V	2.422222
873	2017/04/12	08:51:10	0.985	A	4.695	V	2.425
874	2017/04/12	08:51:20	0.986	A	4.6949	V	2.427778
875	2017/04/12	08:51:30	0.984	A	4.6949	V	2.430556
876	2017/04/12	08:51:40	0.986	A	4.6947	V	2.433333
877	2017/04/12	08:51:50	0.986	A	4.6945	V	2.436111
878	2017/04/12	08:52:00	0.985	A	4.6944	V	2.438889
879	2017/04/12	08:52:10	0.985	A	4.6944	V	2.441667
880	2017/04/12	08:52:20	0.986	A	4.6944	V	2.444444
881	2017/04/12	08:52:30	0.985	A	4.6941	V	2.447222
882	2017/04/12	08:52:40	0.984	A	4.6938	V	2.45
883	2017/04/12	08:52:50	0.984	A	4.6936	V	2.452778
884	2017/04/12	08:53:00	0.985	A	4.6933	V	2.455556
885	2017/04/12	08:53:10	0.985	A	4.6931	V	2.458333
886	2017/04/12	08:53:20	0.985	A	4.6928	V	2.461111
887	2017/04/12	08:53:30	0.985	A	4.6925	V	2.463889
888	2017/04/12	08:53:40	0.984	A	4.6924	V	2.466667
889	2017/04/12	08:53:50	0.985	A	4.6922	V	2.469444
890	2017/04/12	08:54:00	0.984	A	4.6922	V	2.472222
891	2017/04/12	08:54:10	0.983	A	4.6922	V	2.475
892	2017/04/12	08:54:20	0.984	A	4.6917	V	2.477778
893	2017/04/12	08:54:30	0.985	A	4.6914	V	2.480556
894	2017/04/12	08:54:40	0.985	A	4.6911	V	2.483333
895	2017/04/12	08:54:50	0.984	A	4.6906	V	2.486111
896	2017/04/12	08:55:00	0.985	A	4.6904	V	2.488889
897	2017/04/12	08:55:10	0.985	A	4.6902	V	2.491667
898	2017/04/12	08:55:20	0.985	A	4.69	V	2.494444
899	2017/04/12	08:55:30	0.984	A	4.6897	V	2.497222
900	2017/04/12	08:55:40	0.983	A	4.6893	V	2.5
901	2017/04/12	08:55:50	0.986	A	4.6892	V	2.502778
902	2017/04/12	08:56:00	0.984	A	4.6888	V	2.505556
903	2017/04/12	08:56:10	0.984	A	4.6887	V	2.508333

904	2017/04/12	08:56:20	0.984	A	4.6884	V	2.511111
905	2017/04/12	08:56:30	0.985	A	4.6882	V	2.513889
906	2017/04/12	08:56:40	0.985	A	4.6879	V	2.516667
907	2017/04/12	08:56:50	0.982	A	4.6879	V	2.519444
908	2017/04/12	08:57:00	0.984	A	4.6872	V	2.522222
909	2017/04/12	08:57:10	0.984	A	4.6869	V	2.525
910	2017/04/12	08:57:20	0.984	A	4.6869	V	2.527778
911	2017/04/12	08:57:30	0.984	A	4.6877	V	2.530556
912	2017/04/12	08:57:40	0.983	A	4.6858	V	2.533333
913	2017/04/12	08:57:50	0.983	A	4.6853	V	2.536111
914	2017/04/12	08:58:00	0.985	A	4.6852	V	2.538889
915	2017/04/12	08:58:10	0.983	A	4.6862	V	2.541667
916	2017/04/12	08:58:20	0.981	A	4.6869	V	2.544444
917	2017/04/12	08:58:30	0.984	A	4.6856	V	2.547222
918	2017/04/12	08:58:40	0.984	A	4.6838	V	2.55
919	2017/04/12	08:58:50	0.983	A	4.6853	V	2.552778
920	2017/04/12	08:59:00	0.985	A	4.6873	V	2.555556
921	2017/04/12	08:59:10	0.984	A	4.6827	V	2.558333 88 % Charge
922	2017/04/12	08:59:20	0.983	A	4.6831	V	2.561111
923	2017/04/12	08:59:30	0.98	A	4.6839	V	2.563889
924	2017/04/12	08:59:40	0.984	A	4.6967	V	2.566667
925	2017/04/12	08:59:50	0.984	A	4.697	V	2.569444
926	2017/04/12	09:00:00	0.984	A	4.697	V	2.572222
927	2017/04/12	09:00:10	0.985	A	4.6898	V	2.575
928	2017/04/12	09:00:20	0.985	A	4.6906	V	2.577778
929	2017/04/12	09:00:30	0.986	A	4.6905	V	2.580556
930	2017/04/12	09:00:40	0.984	A	4.6917	V	2.583333
931	2017/04/12	09:00:50	0.984	A	4.6906	V	2.586111
932	2017/04/12	09:01:00	0.982	A	4.6912	V	2.588889
933	2017/04/12	09:01:10	0.982	A	4.6902	V	2.591667
934	2017/04/12	09:01:20	0.983	A	4.6899	V	2.594444
935	2017/04/12	09:01:30	0.984	A	4.6907	V	2.597222
936	2017/04/12	09:01:40	0.982	A	4.6935	V	2.6
937	2017/04/12	09:01:50	0.982	A	4.6891	V	2.602778
938	2017/04/12	09:02:00	0.984	A	4.6911	V	2.605556
939	2017/04/12	09:02:10	0.982	A	4.6892	V	2.608333
940	2017/04/12	09:02:20	0.981	A	4.6884	V	2.611111
941	2017/04/12	09:02:30	0.981	A	4.6888	V	2.613889
942	2017/04/12	09:02:40	0.982	A	4.6886	V	2.616667
943	2017/04/12	09:02:50	0.981	A	4.6905	V	2.619444
944	2017/04/12	09:03:00	0.985	A	4.6877	V	2.622222
945	2017/04/12	09:03:10	0.984	A	4.688	V	2.625
946	2017/04/12	09:03:20	0.982	A	4.6879	V	2.627778
947	2017/04/12	09:03:30	0.885	A	4.7239	V	2.630556
948	2017/04/12	09:03:40	0.886	A	4.7467	V	2.633333
949	2017/04/12	09:03:50	0.886	A	4.7468	V	2.636111
950	2017/04/12	09:04:00	0.884	A	4.7471	V	2.638889
951	2017/04/12	09:04:10	0.885	A	4.7472	V	2.641667
952	2017/04/12	09:04:20	0.885	A	4.7482	V	2.644444
953	2017/04/12	09:04:30	0.885	A	4.7504	V	2.647222
954	2017/04/12	09:04:40	0.885	A	4.7505	V	2.65
955	2017/04/12	09:04:50	0.885	A	4.7505	V	2.652778
956	2017/04/12	09:05:00	0.885	A	4.7504	V	2.655556
957	2017/04/12	09:05:10	0.885	A	4.7502	V	2.658333
958	2017/04/12	09:05:20	0.884	A	4.7501	V	2.661111
959	2017/04/12	09:05:30	0.886	A	4.7499	V	2.663889
960	2017/04/12	09:05:40	0.886	A	4.7497	V	2.666667
961	2017/04/12	09:05:50	0.886	A	4.7496	V	2.669444
962	2017/04/12	09:06:00	0.886	A	4.7493	V	2.672222
963	2017/04/12	09:06:10	0.885	A	4.7491	V	2.675
964	2017/04/12	09:06:20	0.886	A	4.749	V	2.677778
965	2017/04/12	09:06:30	0.884	A	4.7488	V	2.680556
966	2017/04/12	09:06:40	0.886	A	4.7488	V	2.683333
967	2017/04/12	09:06:50	0.884	A	4.7487	V	2.686111
968	2017/04/12	09:07:00	0.885	A	4.7485	V	2.688889
969	2017/04/12	09:07:10	0.884	A	4.7483	V	2.691667
970	2017/04/12	09:07:20	0.885	A	4.748	V	2.694444
971	2017/04/12	09:07:30	0.884	A	4.724	V	2.697222
972	2017/04/12	09:07:40	0.886	A	4.7325	V	2.7
973	2017/04/12	09:07:50	0.886	A	4.733	V	2.702778
974	2017/04/12	09:08:00	0.886	A	4.7331	V	2.705556
975	2017/04/12	09:08:10	0.885	A	4.7331	V	2.708333
976	2017/04/12	09:08:20	0.886	A	4.733	V	2.711111
977	2017/04/12	09:08:30	0.885	A	4.7328	V	2.713889
978	2017/04/12	09:08:40	0.886	A	4.7327	V	2.716667
979	2017/04/12	09:08:50	0.885	A	4.7326	V	2.719444
980	2017/04/12	09:09:00	0.884	A	4.7323	V	2.722222
981	2017/04/12	09:09:10	0.884	A	4.7322	V	2.725
982	2017/04/12	09:09:20	0.885	A	4.7321	V	2.727778
983	2017/04/12	09:09:30	0.885	A	4.7319	V	2.730556
984	2017/04/12	09:09:40	0.885	A	4.7319	V	2.733333
985	2017/04/12	09:09:50	0.885	A	4.7318	V	2.736111
986	2017/04/12	09:10:00	0.885	A	4.7318	V	2.738889
987	2017/04/12	09:10:10	0.886	A	4.7315	V	2.741667
988	2017/04/12	09:10:20	0.886	A	4.7314	V	2.744444
989	2017/04/12	09:10:30	0.886	A	4.7313	V	2.747222
990	2017/04/12	09:10:40	0.886	A	4.731	V	2.75
991	2017/04/12	09:10:50	0.886	A	4.7309	V	2.752778
992	2017/04/12	09:11:00	0.886	A	4.7307	V	2.755556
993	2017/04/12	09:11:10	0.886	A	4.7306	V	2.758333
994	2017/04/12	09:11:20	0.885	A	4.7304	V	2.761111

995	2017/04/12	09:11:30	0.886	A	4.7302	V	2.763889
996	2017/04/12	09:11:40	0.886	A	4.7299	V	2.766667
997	2017/04/12	09:11:50	0.886	A	4.7298	V	2.769444
998	2017/04/12	09:12:00	0.872	A	4.7356	V	2.772222
999	2017/04/12	09:12:10	0.858	A	4.746	V	2.775
1000	2017/04/12	09:12:20	0.846	A	4.7557	V	2.777778
1001	2017/04/12	09:12:30	0.835	A	4.7638	V	2.780556
1002	2017/04/12	09:12:40	0.824	A	4.7709	V	2.783333
1003	2017/04/12	09:12:50	0.813	A	4.7786	V	2.786111
1004	2017/04/12	09:13:00	0.803	A	4.7854	V	2.788889
1005	2017/04/12	09:13:10	0.795	A	4.7917	V	2.791667
1006	2017/04/12	09:13:20	0.786	A	4.7987	V	2.794444
1007	2017/04/12	09:13:30	0.777	A	4.8046	V	2.797222
1008	2017/04/12	09:13:40	0.769	A	4.8101	V	2.8
1009	2017/04/12	09:13:50	0.76	A	4.8168	V	2.802778
1010	2017/04/12	09:14:00	0.752	A	4.8233	V	2.805556
1011	2017/04/12	09:14:10	0.745	A	4.8272	V	2.808333
1012	2017/04/12	09:14:20	0.737	A	4.8332	V	2.811111
1013	2017/04/12	09:14:30	0.73	A	4.8371	V	2.813889
1014	2017/04/12	09:14:40	0.722	A	4.8413	V	2.816667
1015	2017/04/12	09:14:50	0.715	A	4.8475	V	2.819444
1016	2017/04/12	09:15:00	0.708	A	4.8528	V	2.822222
1017	2017/04/12	09:15:10	0.701	A	4.8576	V	2.825
1018	2017/04/12	09:15:20	0.694	A	4.8621	V	2.827778
1019	2017/04/12	09:15:30	0.688	A	4.8677	V	2.830556
1020	2017/04/12	09:15:40	0.68	A	4.8718	V	2.833333
1021	2017/04/12	09:15:50	0.675	A	4.8758	V	2.836111
1022	2017/04/12	09:16:00	0.668	A	4.8808	V	2.838889
1023	2017/04/12	09:16:10	0.66	A	4.8853	V	2.841667
1024	2017/04/12	09:16:20	0.656	A	4.889	V	2.844444
1025	2017/04/12	09:16:30	0.649	A	4.8931	V	2.847222
1026	2017/04/12	09:16:40	0.644	A	4.8983	V	2.85
1027	2017/04/12	09:16:50	0.637	A	4.9018	V	2.852778
1028	2017/04/12	09:17:00	0.631	A	4.9063	V	2.855556
1029	2017/04/12	09:17:10	0.626	A	4.9103	V	2.858333
1030	2017/04/12	09:17:20	0.62	A	4.9142	V	2.861111
1031	2017/04/12	09:17:30	0.614	A	4.9181	V	2.863889
1032	2017/04/12	09:17:40	0.61	A	4.9215	V	2.866667
1033	2017/04/12	09:17:50	0.604	A	4.9243	V	2.869444
1034	2017/04/12	09:18:00	0.599	A	4.9289	V	2.872222
1035	2017/04/12	09:18:10	0.594	A	4.9319	V	2.875
1036	2017/04/12	09:18:20	0.589	A	4.9332	V	2.877778
1037	2017/04/12	09:18:30	0.584	A	4.9362	V	2.880556
1038	2017/04/12	09:18:40	0.58	A	4.9407	V	2.883333
1039	2017/04/12	09:18:50	0.575	A	4.9434	V	2.886111
1040	2017/04/12	09:19:00	0.571	A	4.9466	V	2.888889
1041	2017/04/12	09:19:10	0.707	A	4.8442	V	2.891667
1042	2017/04/12	09:19:20	0.702	A	4.8539	V	2.894444
1043	2017/04/12	09:19:30	0.701	A	4.8488	V	2.897222
1044	2017/04/12	09:19:40	0.557	A	4.9508	V	2.9
1045	2017/04/12	09:19:50	0.55	A	4.9553	V	2.902778
1046	2017/04/12	09:20:00	0.545	A	4.9597	V	2.905556
1047	2017/04/12	09:20:10	0.541	A	4.9635	V	2.908333
1048	2017/04/12	09:20:20	0.537	A	4.966	V	2.911111
1049	2017/04/12	09:20:30	0.533	A	4.9697	V	2.913889
1050	2017/04/12	09:20:40	0.529	A	4.9723	V	2.916667
1051	2017/04/12	09:20:50	0.525	A	4.9746	V	2.919444
1052	2017/04/12	09:21:00	0.521	A	4.9774	V	2.922222
1053	2017/04/12	09:21:10	0.517	A	4.9807	V	2.925
1054	2017/04/12	09:21:20	0.512	A	4.9831	V	2.927778
1055	2017/04/12	09:21:30	0.66	A	4.8745	V	2.930556
1056	2017/04/12	09:21:40	0.649	A	4.8774	V	2.933333
1057	2017/04/12	09:21:50	0.637	A	4.8886	V	2.936111
1058	2017/04/12	09:22:00	0.649	A	4.9857	V	2.938889
1059	2017/04/12	09:22:10	0.64	A	4.888	V	2.941667
1060	2017/04/12	09:22:20	0.633	A	4.8861	V	2.944444
1061	2017/04/12	09:22:30	0.637	A	4.8963	V	2.947222
1062	2017/04/12	09:22:40	0.644	A	4.8931	V	2.95
1063	2017/04/12	09:22:50	0.628	A	4.8952	V	2.952778
1064	2017/04/12	09:23:00	0.623	A	4.9034	V	2.955556
1065	2017/04/12	09:23:10	0.628	A	4.8954	V	2.958333
1066	2017/04/12	09:23:20	0.614	A	4.9028	V	2.961111
1067	2017/04/12	09:23:30	0.611	A	4.9032	V	2.963889
1068	2017/04/12	09:23:40	0.476	A	4.9574	V	2.966667
1069	2017/04/12	09:23:50	0.472	A	4.9617	V	2.969444
1070	2017/04/12	09:24:00	0.465	A	4.9646	V	2.972222
1071	2017/04/12	09:24:10	0.463	A	4.9665	V	2.975
1072	2017/04/12	09:24:20	0.462	A	4.97	V	2.977778
1073	2017/04/12	09:24:30	0.457	A	4.9717	V	2.980556
1074	2017/04/12	09:24:40	0.454	A	4.974	V	2.983333
1075	2017/04/12	09:24:50	0.45	A	4.9762	V	2.986111
1076	2017/04/12	09:25:00	0.447	A	4.9793	V	2.988889
1077	2017/04/12	09:25:10	0.444	A	4.9815	V	2.991667
1078	2017/04/12	09:25:20	0.441	A	4.9836	V	2.994444
1079	2017/04/12	09:25:30	0.437	A	4.9854	V	2.997222
1080	2017/04/12	09:25:40	0.433	A	4.9874	V	3
1081	2017/04/12	09:25:50	0.576	A	4.9347	V	3.002778
1082	2017/04/12	09:26:00	0.569	A	4.9406	V	3.005556
1083	2017/04/12	09:26:10	0.559	A	4.9401	V	3.008333
1084	2017/04/12	09:26:20	0.424	A	4.9935	V	3.011111
1085	2017/04/12	09:26:30	0.422	A	4.9965	V	3.013889

95% Charged.

1086	2017/04/12	09:26:40	0.418	A	4.9995	V	3.016667
1087	2017/04/12	09:26:50	0.413	A	5.0012	V	3.019444
1088	2017/04/12	09:27:00	0.411	A	5.0037	V	3.022222
1089	2017/04/12	09:27:10	0.407	A	5.0054	V	3.025
1090	2017/04/12	09:27:20	0.404	A	5.0071	V	3.027778
1091	2017/04/12	09:27:30	0.404	A	5.0095	V	3.030556
1092	2017/04/12	09:27:40	0.4	A	5.0114	V	3.033333
1093	2017/04/12	09:27:50	0.397	A	5.0127	V	3.036111
1094	2017/04/12	09:28:00	0.394	A	5.0151	V	3.038889
1095	2017/04/12	09:28:10	0.391	A	5.0173	V	3.041667
1096	2017/04/12	09:28:20	0.389	A	5.0186	V	3.044444
1097	2017/04/12	09:28:30	0.385	A	5.0207	V	3.047222
1098	2017/04/12	09:28:40	0.383	A	5.0225	V	3.05
1099	2017/04/12	09:28:50	0.382	A	5.0247	V	3.052778
1100	2017/04/12	09:29:00	0.379	A	5.0261	V	3.055556
1101	2017/04/12	09:29:10	0.376	A	5.028	V	3.058333
1102	2017/04/12	09:29:20	0.522	A	5.0301	V	3.061111
1103	2017/04/12	09:29:30	0.507	A	4.923	V	3.063889
1104	2017/04/12	09:29:40	0.505	A	4.936	V	3.066667
1105	2017/04/12	09:29:50	0.367	A	4.9419	V	3.069444
1106	2017/04/12	09:30:00	0.366	A	5.0353	V	3.072222
1107	2017/04/12	09:30:10	0.363	A	5.0381	V	3.075
1108	2017/04/12	09:30:20	0.361	A	5.0402	V	3.077778
1109	2017/04/12	09:30:30	0.358	A	5.0415	V	3.080556
1110	2017/04/12	09:30:40	0.356	A	5.0434	V	3.083333
1111	2017/04/12	09:30:50	0.539	A	5.0445	V	3.086111
1112	2017/04/12	09:31:00	0.351	A	5.0469	V	3.088889
1113	2017/04/12	09:31:10	0.348	A	5.0483	V	3.091667
1114	2017/04/12	09:31:20	0.346	A	5.0497	V	3.094444
1115	2017/04/12	09:31:30	0.345	A	5.0512	V	3.097222
1116	2017/04/12	09:31:40	0.343	A	5.0532	V	3.1
1117	2017/04/12	09:31:50	0.341	A	5.055	V	3.102778
1118	2017/04/12	09:32:00	0.338	A	5.0566	V	3.105556
1119	2017/04/12	09:32:10	0.337	A	5.0584	V	3.108333
1120	2017/04/12	09:32:20	0.334	A	5.0603	V	3.111111 100 % Charge
1121	2017/04/12	09:32:30	0.332	A	5.0615	V	3.113889

99%

Test Setup:

- 1.Used a standard cables: Belkin lightning 4ft cable, Belin 4ft A-C Cable
- 2.Retest required using OEM cable.

No.	Device	Battery % on the device	Charge symbol	Current drawn (A)	Comments
Phones					
iOS					
1	iPhone 7	43%	Yes	1.87	Tested for Compatibility
3	iPhone 7 Plus	41%	Yes	1.93	Completed full charge cycle
4	iPhone SE	14%	Yes	0.98	Completed full charge cycle
5	iPhone 6S	3%	Yes	0.95	Completed full charge cycle
5	iPhone 6S plus	4%	Yes	1.44	Completed full charge cycle
6	iPhone 6	93%	Yes	1.04	Completed full charge cycle
7	iPhone 6 Plus	15%	Yes	1.68	Completed full charge cycle
8	iPhone 5S	9%	Yes	0.97	Completed full charge cycle
9	iPhone 5C	7%	Yes	0.91	Completed full charge cycle
10	iPod Touch 5G	6%	Yes	0.53	Completed full charge cycle
11	iPad Pro 13'	4%	Yes	2.25	Completed full charge cycle
12	iPad Pro 11	6%	Yes	2.11	Completed full charge cycle
13	iPad Air 2	18%	Yes	2.15	Completed full charge cycle
14	iPad Mini 3	22%	Yes	1.97	Completed full charge cycle
Android					
1	Samsung S7	8%	Yes	1.31	Completed full charge cycle
2	Samsung S7 Edge	71%	Yes	1.49	
	Note 5	12%	Yes	1.52	Completed full charge cycle
1	Galaxy Tab A	1%	Yes	0.92	Completed full charge cycle
2	Galaxy Tab 4	14%	Yes	0.99	Completed full charge cycle
3	Note 2014	7%	Yes	1.78	Tested for compatibility
3	Tab Pro	5%	Yes	1.74	Tested for compatibility
Type C					
1	Google Pixel	34%	Yes	1.07	Tested for compatibility
2	Pixel XL	3%	Yes	0.91	Tested for compatibility
3	LG G5	78%	Yes	1.16	Tested for compatibility
4	LG V20	9%	Yes	1.1	Tested for compatibility
5	Nexus 6P	17%	Yes	1.11	Tested for compatibility
6	One Plus	45%	Yes	0.83	Tested for compatibility

See Charge profile

QA Certification Report

Executive Test summary:

Test Execution %:	100
Quality Level %:	100

Release Recommendation:

Vendor Release to Production/Customer Recommendation:	n/a
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Product Information:

<The table below should include one product only>

Product name:	10000 mAh Li Polymer Battery Pack
SKU ID:	F7U020
Hardware Version:	To be provided by Vendor
Software Version:	n/a
Firmware Version:	n/a
Firmware Build Date:	n/a
Board Information	To be provided by Vendor
SKU Vendor	DBK

Test Cycle:

Project Name:	Worm 2
Test Cycle:	FAS
Test Cycle Start Date:	
Test Cycle End Date:	
Tested By:	Salvador Deldago
Number of Test Samples:	1

Detailed Test summary:

<list test results here split into category>

Number of Tests Planned:	1
Number of Tests Executed:	1
Number of Tests Failed:	0
Test Types Covered:	Compatibility,
Test report:	See Test Summary

General Feedback:

<Please list any general comments you want convey to Belkin>

Item #	Remarks / Notes
1	Package claims battery pack charges iPhoen
2	

ISSUE summary table:

<Please list issues identified during this testing cycle>

Severity	ID	Title	Blocking Issue?	Occurrence rate	Assigned to(id)
			1		

Test Configuration:

<The table below includes all Operating Systems, browsers and their versions, and language packs which were tested>

Test Configuration	Operating System Type	Operating System Version	Operating System Service Pack	Browser Type	Browser Version	OS Language	Software Language
1							
2							
3							

Test Pre-Conditions

No ther app is running in background
WiFi, BT ON to simulate the charge times use case.
Record the ambient temperature.
Ambeint temp: 24+/-1C

Project	Cell Capacity (mAh)	Rated Capacity (mAh)	Compatible Device	Compatible Device Battery Health %	of Compatible device from apple.com	Additional Charges
F7U020	10000	6440	iPhone 7 (iOS 12)	98%	1960	2.8 times



2021 Lithium Battery Guidance Document

Transport of Lithium Metal and Lithium Ion Batteries

Revised for the 2021 Regulations

Introduction

△ This document is based on the provisions set out in the 2021-2022 Edition of the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Technical Instructions) and the 62nd Edition of the IATA Dangerous Goods Regulations (DGR).

The provisions of the DGR with respect to lithium batteries may also be found in the IATA lithium Battery Shipping Guidelines (LBSG) 8th Edition. In addition to the content from the DGR, the LBSG also has additional classification flowcharts and detailed packing and documentation examples for lithium batteries.

Information on the DGR and LBSG can be found here:

<http://www.iata.org/dgr>

<http://www.iata.org/lbsg>

The purpose of this document is to provide guidance for complying with provisions applicable to the transport by air of lithium batteries as set out in the DGR. Specifically, the document provides information on:

- Definitions;
- Classification (including classification flowcharts);
- Prohibitions;
- Restrictions;
- Frequently Asked Questions
- Additional Information
- Abbreviations, Acronyms, Symbols

IATA Lithium Battery Guidance Document – 2021

Definitions

Lithium Battery – The term “lithium battery” refers to a family of batteries with different chemistries, comprising many types of cathodes and electrolytes. For the purposes of the DGR they are separated into:

Lithium metal batteries. Are generally primary (non-rechargeable) batteries that have lithium metal or lithium compounds as an anode. Also included within lithium metal are lithium alloy batteries. Lithium metal batteries are generally used to power devices such as watches, calculators, cameras, temperature data loggers, car key fobs and defibrillators.

△ **Note:**

Lithium metal batteries packed by themselves (not contained in or packed with equipment) (Packing Instruction 968) are forbidden for transport as cargo on passenger aircraft. In accordance with Special Provision A201, lithium metal cells or batteries that meet the quantity limits of Section II of PI 968 may be shipped on a passenger aircraft under an approval issued by the authority of the State of Origin, State of Destination and State of the Operator. Or in the case of urgent medical need, one consignment of lithium batteries may be transported as Class 9 (UN 3090) on passenger aircraft with the prior approval of the authority of the State of origin and with the approval of the operator, see Special Provision A201. All other lithium metal cells and batteries can only be shipped on a passenger aircraft under exemption issued by all States concerned.



Figure 1 - Example of Lithium Metal Cells and Batteries

Lithium-ion batteries (sometimes abbreviated Li-ion batteries) are a secondary (rechargeable) battery where the lithium is only present in an ionic form in the electrolyte. Also included within the category of lithium-ion batteries are lithium polymer batteries. Lithium-ion batteries are generally used to power devices such as mobile telephones, laptop computers, tablets, power tools and e-bikes.



Figure 2 - Example of Lithium Ion Cells and Batteries

△ **Note:**

Lithium ion batteries packed by themselves (Packing Instruction 965) (not contained in or packed with equipment):

(a) must be shipped at a state of charge (SoC) not exceeding 30% of their rated capacity. Cells and/or batteries at a SoC of greater than 30% may only be shipped with the approval of the State

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of Origin and the State of the Operator under the written conditions established by those authorities, see Special Provision A331; and

(b) may be shipped as cargo on a passenger aircraft under an approval issued by the authority of the State of Origin, State of Destination and State of the Operator where the lithium ion cells or batteries that meet the quantity limits of Section II of PI 965, or in the case of urgent medical need, one consignment of lithium batteries may be transported as Class 9 (UN 3480) on passenger aircraft with the prior approval of the authority of the State of origin and with the approval of the operator, see Special Provision A201. All other lithium ion cells and batteries can only be shipped as cargo on a passenger aircraft under exemption issued by all States concerned.

Aggregate lithium content means the sum of the grams of lithium content contained by the cells comprising a battery.

The technical definition of a battery and cell, as indicated in the UN *Manual of Tests and Criteria*, is as follows:

Battery means two or more cells or batteries which are electrically connected together and fitted with devices necessary for use, for example, case, terminals, marking and protective devices. Units which have two or more cells that are commonly referred to as "battery packs", "modules" or "battery assemblies" having the primary function of providing a source of power to another piece of equipment are for the purposes of the UN Model Regulations and this guidance document treated as batteries. See definitions for "cell" and "single cell battery". (See also "Power Banks")

Button cell or battery means a round small cell or battery when the overall height is less than the diameter.

Cell means a single encased electrochemical unit (one positive and one negative electrode) which exhibits a voltage differential across its two terminals. Under the UN Model Regulations, UN *Manual of Tests and Criteria* and this guidance, to the extent the encased electrochemical unit meets the definition of "cell" herein, it is a "cell", not a "battery", regardless of whether the unit is termed a "battery" or a "single cell battery" outside of the UN Model Regulations, the UN *Manual of Tests and Criteria* and this guidance.

Consignment, one or more packages of dangerous goods accepted by an operator (airline) from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address.

Net Quantity Either:

- (a) the weight or volume of the dangerous goods contained in a package excluding the weight or volume of any packaging material; or
- (b) the weight of an unpackaged article of dangerous goods (e.g. UN 3166).

For the purposes of this definition "dangerous goods" means the substance or article as described by the proper shipping name shown in Table 4.2, e.g. for "Fire extinguishers", the net quantity is the weight of the fire extinguisher. For articles packed with equipment or contained in equipment, the net quantity is the net weight of the article, e.g. for "Lithium ion batteries contained in equipment", the net quantity is the net weight of the lithium ion batteries in the package.

Overpack means an enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage. Dangerous goods packages contained in the overpack must be properly packed, marked, labelled and in proper condition as required by the IATA Dangerous Goods Regulations.

The overpack must not contain packages enclosing different substances which might react dangerously with each other or packages of dangerous goods which require segregation according

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to Table 9.3.A. In addition, packages containing UN 3090, lithium metal batteries prepared in accordance with Section IA or Section IB of PI968 or UN 3480, lithium ion batteries prepared in accordance with Section IA or Section IB of PI 965 are not permitted in an overpack with packages containing dangerous goods classified in Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1.

Power Bank (power pack, mobile battery, etc.). These are portable devices designed to be able to charge consumer devices such as mobile phones and tablets. For the purposes of this guidance document and the IATA Dangerous Goods Regulations, power banks are to be classified as batteries and must be assigned to UN 3480, lithium ion batteries, or UN 3090, lithium metal batteries, as applicable. For carriage by passengers, power banks are considered spare batteries and must be individually protected from short-circuit and carried in carry-on baggage only.

Rated capacity means the capacity, in ampere-hours or milliampere-hours, of a cell or battery as measured by subjecting it to a load, temperature and voltage cut-off point specified by the manufacturer.

Note:

The following IEC standards provide guidance and methodology for determining the rated capacity:

- (1) IEC 61960 (First Edition 2003-12): Secondary cells and batteries containing alkaline or other non-acid electrolytes -Secondary lithium cells and batteries for portable applications;*
- (2) IEC 62133 (First Edition 2002-10): Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications;*
- (3) IEC 62660-1 (First Edition 2011-01): Secondary lithium-ion cells for the propulsion of electric road vehicles-Part 1: Performance testing.*

State of Origin, the country (State) in the territory of which the consignment is to first be loaded on an aircraft.

State of the Operator, the country (State) in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

Watt-hour Rating, expressed in Watt-hours (Wh), the Watt-hour rating of a lithium cell or battery is calculated by multiplying the rated capacity in ampere-hours by the nominal voltage.

Classification (DGR 3.9.2.6)

Lithium batteries are classified in Class 9 – Miscellaneous dangerous goods as:

- UN 3090, **Lithium metal batteries**; or
- UN 3480, **Lithium ion batteries**

or, if inside a piece of equipment or packed separately with a piece of equipment to power that equipment as:

- UN 3091, **Lithium metal batteries contained in equipment**; or
- UN 3091, **Lithium metal batteries packed with equipment**; and
- UN 3481, **Lithium ion batteries contained in equipment**; or
- UN 3481, **Lithium ion batteries packed with equipment**.

Lithium battery test summary –manufacturers and subsequent distributors of cells or batteries and equipment powered by cells and batteries manufactured after 30 June 2003 must make available the test summary as specified in the UN *Manual of Tests and Criteria*, Revision 6 and amend. 1, Part III, sub-section 38.3, paragraph 38.3.5.

Note:

The requirement is for the manufacturer and subsequent distributors to make this test summary available. There are numerous ways this can be achieved, such as by listing the applicable summary document on the company website. There is no expectation for the shipper/distributor to provide paper copies with each consignment containing lithium batteries. The supply chain are encouraged to make use of technology to facilitate the availability of the test summary.

The following table provides details of the information required in the test summary:

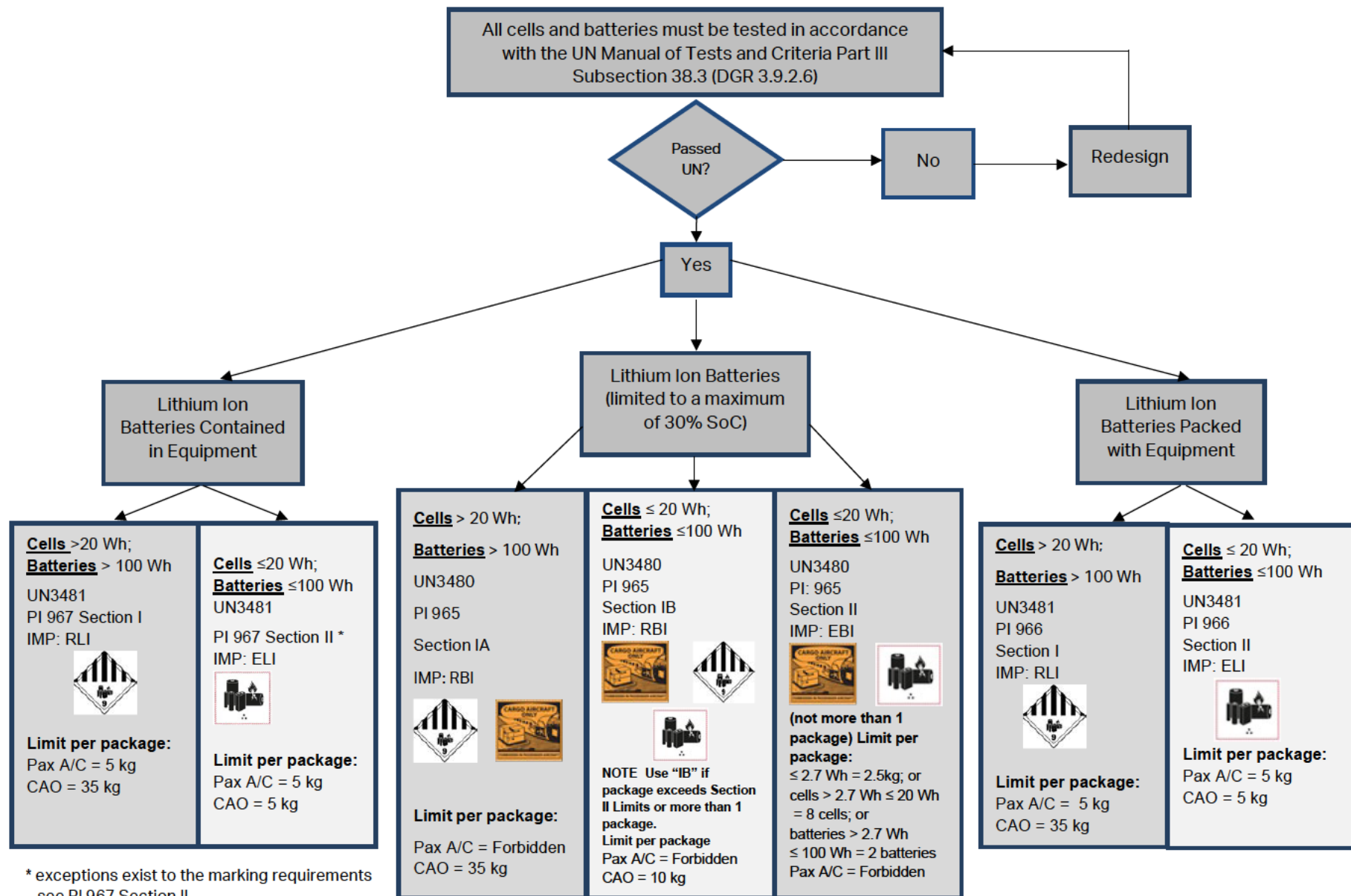
Lithium cell or battery test summary in accordance with sub-section 38.3 of Manual of Tests and Criteria
<p>The following information shall be provided in this test summary:</p> <ul style="list-style-type: none"> (a) Name of cell, battery, or product manufacturer, as applicable; (b) Cell, battery, or product manufacturer's contact information to include address, phone number, email address and website for more information; (c) Name of the test laboratory to include address, phone number, email address and website for more information; (d) A unique test report identification number; (e) Date of test report; (f) Description of cell or battery to include at a minimum: <ul style="list-style-type: none"> (i) Lithium ion or lithium metal cell or battery; (ii) Mass; (iii) Watt-hour rating, or lithium content; (iv) Physical description of the cell/battery; and (v) Model numbers. (g) List of tests conducted and results (i.e., pass/fail); (h) Reference to assembled battery testing requirements, if applicable (i.e. 38.3.3 (f) and 38.3.3 (g)); (i) Reference to the revised edition of the Manual of Tests and Criteria used and to amendments thereto, if any; and (j) Signature with name and title of signatory as an indication of the validity of information provided.

Further information on the test summary and FAQ's is available in Part 4 of this guidance document.

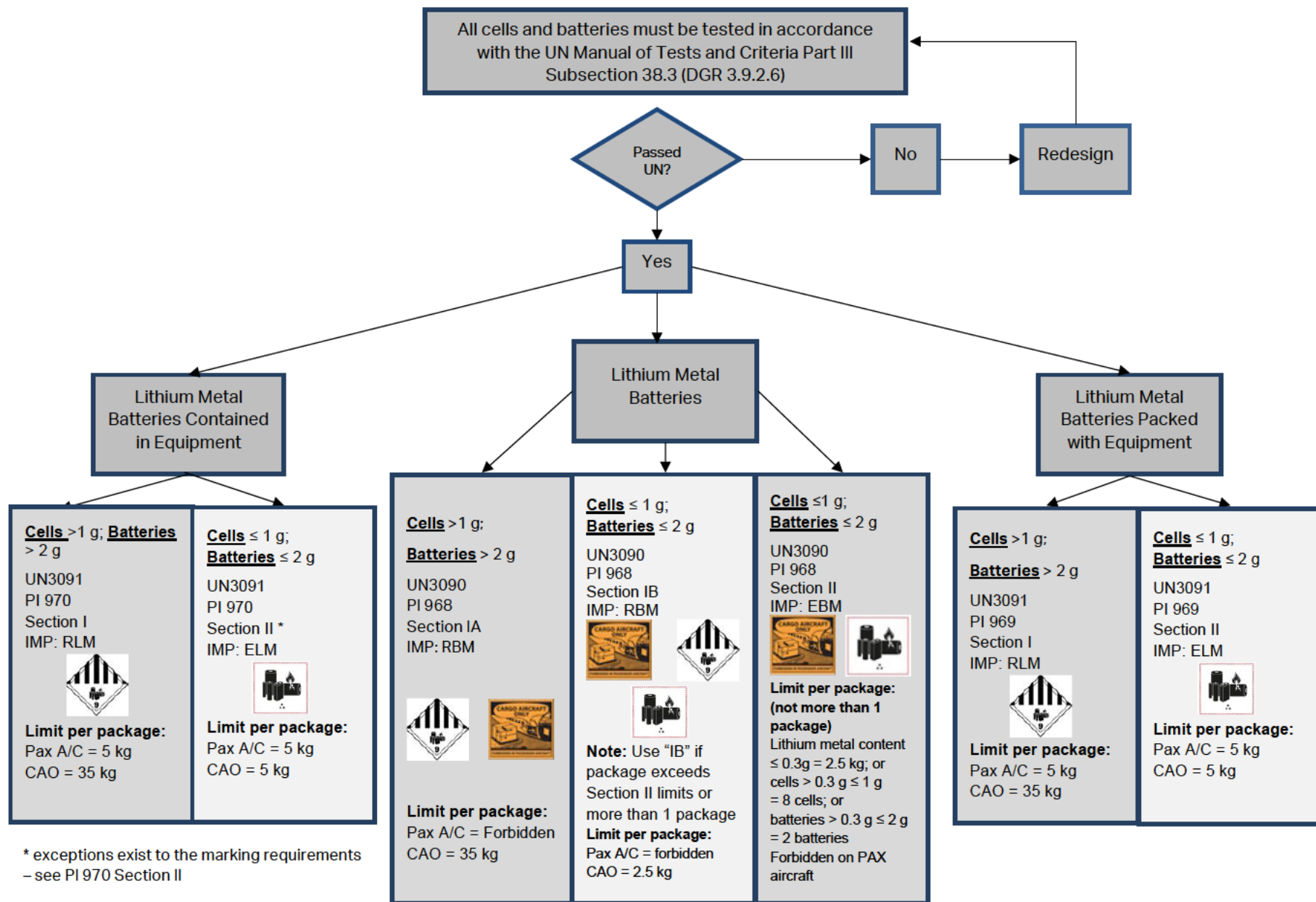
Classification Flowcharts

The following (2) classification flowcharts are intended to provide guidance on the classification for lithium ion and lithium metal batteries.

Classification Flowchart – Lithium Ion Batteries



Classification Flowchart – Lithium Metal Batteries



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Prohibitions

Lithium ion batteries

All lithium ion cells and batteries shipped by themselves (UN 3480) are forbidden for transport as cargo on passenger aircraft. All packages prepared in accordance with Packing Instruction 965, Section IA, IB and II, must bear a Cargo Aircraft Only label, in addition to other required marks and/or labels.

Lithium metal batteries

All lithium metal cells and batteries shipped by themselves (UN 3090) are forbidden for transport as cargo on passenger aircraft. All packages prepared in accordance with Packing Instruction 968, Section IA, IB and II, must bear a Cargo Aircraft Only label, in addition to other required marks and/or labels.

Restrictions

Lithium ion batteries

All lithium ion cells and batteries (UN 3480 only) must be shipped at a state of charge (SoC) not exceeding 30% of their rated capacity. Cells and/or batteries at a SoC of greater than 30% may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities, see Special Provision A331.

Packing Restrictions

PI 965 & PI 968 Section IA & IB

UN 3090, lithium metal batteries prepared in accordance with Section IA or Section IB of PI 968 and UN 3480, lithium ion batteries prepared in accordance with Section IA or Section IB of PI 965 must not be packed in the same outer packaging with dangerous goods classified in Class 1 (explosives) other than Division 1.4S, Division 2.1 (flammable gases), Class 3 (flammable liquids), Division 4.1 (flammable solids) or Division 5.1 (oxidizers). Packages containing cells or batteries must not be placed in an overpack with packages containing dangerous goods classified in Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1.

PI 965 & PI 968 Section II

Cells and batteries must not be packed in the same outer packaging with other dangerous goods. Shippers are restricted to offering one package per consignment. Packages and overpacks must be offered to the operator separately from other cargo and must not be loaded into a unit load device before being offered to the operator.

Frequently Asked Questions

Part 1 – Questions Related to Definitions**A. What are the various types of lithium batteries?**

Lithium batteries fall into two broad classifications; lithium metal batteries and lithium ion batteries. Lithium metal batteries are generally non-rechargeable and contain metallic lithium. Lithium ion batteries contain lithium which is only present in an ionic form in the electrolyte and are rechargeable.

Within these two broad classifications there are many different chemistries. For example within lithium ion batteries there are lithium polymer, lithium iron phosphate (LiFePO₄), lithium air to name a few.

B. What is the difference between a lithium cell and a lithium battery?

A lithium cell is a single encased electrochemical unit consisting of one positive and one negative electrode that exhibits a voltage differential across the two terminals. A lithium battery is two or more cells electrically connected. A single cell battery is considered a cell and not a battery for the purposes of the limitations set out in the DGR.

Note:

Units that are commonly referred to as “battery packs” or “power banks” having the primary function of providing a source of power to another piece of equipment are for the purposes of these Regulations treated as batteries. This includes uninterruptible power supply (UPS) fitted with lithium ion batteries. Refer to the section on Definitions for complete details.

C. How are component cells connected to form a battery?

Cells in batteries may be connected in parallel, in series, or in a combination of the two. When cells are connected in series, the voltage of the battery increases but the capacity in ampere-hours (Ah) does not change. By contrast, when cells are connected in parallel the capacity in ampere-hours of the battery (Ah) increases but the voltage stays the same.

D. How do I determine the watt-hour rating for a particular lithium ion battery?

The Watt-hour (Wh) rating is a measure by which lithium ion batteries are regulated. Section I lithium ion batteries manufactured after 31 December 2011 and Section IB and Section II lithium ion batteries manufactured after 1 January 2009 are required to be marked with the Watt-hour rating on the outside case.

You can also arrive at the number of Watt-hours your battery provides if you know the battery's nominal voltage (V) and capacity in ampere-hours (Ah):

$$\text{Ah} \times \text{V} = \text{Wh}$$

Note:

If only the milliampere-hours (mAh) are marked on the battery then divide that number by 1000 to get ampere-hours (Ah) (i.e. 4400 mAh / 1000 = 4.4. Ah).

Most lithium ion batteries marketed to consumers are below 100 Watt-hours. If you are unsure of the Watt-hour rating of your lithium ion battery, contact the manufacturer.

E. What is a button cell battery?

A button cell battery is a round small cell where the overall height is less than the diameter. Button cells are often referred to as “coin” cells.

Part 2 – Questions related to Packaging and Transport Provisions**A. How do I safely package lithium batteries for transport?**

One of the major risks associated with the transport of batteries and battery-powered equipment is short-circuit of the battery as a result of the battery terminals coming into contact with other batteries, metal objects, or conductive surfaces. Packaged batteries or cells must be separated in a way to prevent short circuits and damage to terminals. They must be packed in a strong rigid outer packaging unless when contained in equipment, the battery is afforded equivalent protection by the equipment in which it is contained. Sample packaging meeting these requirements is shown below:

**B. How can batteries be effectively protected against short circuit?**

Methods to protect against short circuit include, but are not limited to, the following methods:

- Packing each battery or each battery-powered device when practicable, in fully enclosed inner packagings made of non-conductive material (such as a plastic bag);
- Separating or packing batteries in a manner to prevent contact with other batteries, devices or conductive materials (e.g. metal) in the packagings; and
- Ensuring exposed terminals or connectors are protected with non-conductive caps, non-conductive tape, or by other appropriate means.

If not impact resistant, the outer packaging must not be used as the sole means of protecting the battery terminals from damage or short-circuiting. Batteries should be securely cushioned and packed to prevent shifting which could loosen terminal caps or reorient the terminals to produce short circuits.

Terminal protection methods include but are not limited to the following:

- Securely attaching covers of sufficient strength to protect the terminals;
- Packaging the battery in a rigid plastic packaging; and
- Constructing the battery with terminals that are recessed or otherwise protected so that the terminals will not be subjected to damage if the package is dropped.

C. I'm shipping using Section II of the packing instructions, what constitutes "adequate instruction"?

Shippers of lithium batteries prepared in accordance with Section II of the lithium battery packing instructions are not subject to the formal dangerous goods training requirements set out in DGR 1.5, however, persons preparing such shipments must be provided with "adequate instruction" as described in DGR 1.6.

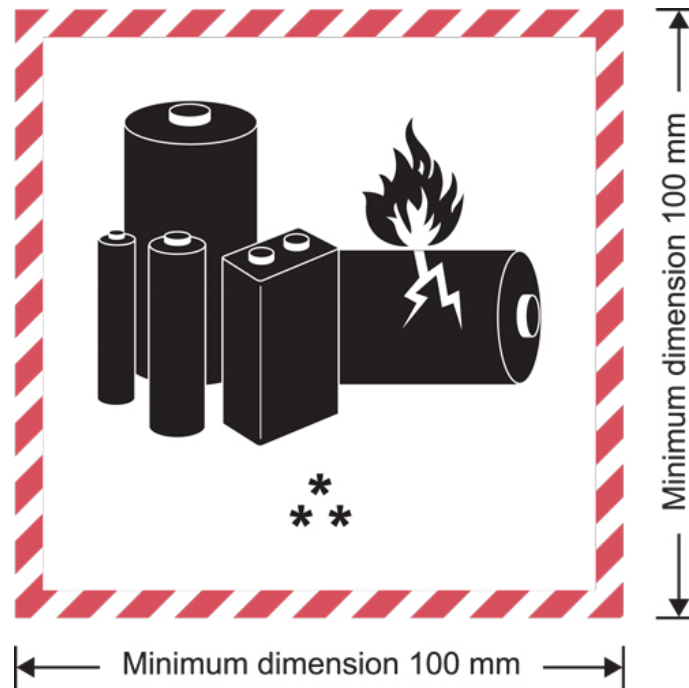
The following is offered as a starting point for an employer on what could be considered as being adequate instruction:

1. The employer must identify the different configurations of lithium batteries that they ship, i.e. lithium batteries and/or lithium batteries packed with equipment and/or lithium batteries contained in equipment; lithium metal batteries and/or lithium ion batteries.
2. The employer must document the procedures that apply to the configurations and battery types that they ship as determined in 1, above.
3. The procedures should be written up as a clear work instruction or other information that is available to all employees responsible for the preparation of lithium battery shipments.
4. All employees that are involved in the process of preparing lithium battery shipments must be taken through the procedure to ensure that they understand and can demonstrate the correct application of documented procedures for the packing, labelling, marking and documentations requirements, as applicable to their job function.
5. A record must be maintained that identifies each applicable employee and the date(s) that this instruction was provided.
6. Employees should be given periodic refresher, or at least demonstrate that they remain "adequately" instructed on how to perform the task. This should be done at least every two years or whenever the procedure is revised, or regulations are changed, whichever is sooner.
7. Companies that are involved in reverse logistics, i.e. arranging for returns of lithium batteries, lithium batteries packed with equipment or lithium batteries contained in equipment must develop a clear instruction for consumers on the process to be followed for returning products. This instruction must include packaging materials and lithium battery marks, as necessary. The instruction must also include the transport method and mode of transport that must be followed; this must include a clear statement on applicable prohibitions.

△ D. What does the lithium battery mark look like and when is it required?

The lithium battery mark is required as specified in the additional requirements of Section II of Packing Instructions 965, 966, 967, 968, 969 and 970. It is also required as specified in the additional requirements of Section IB of Packing Instructions 965 and 968 in addition to the Class 9 lithium battery hazard label and Cargo Aircraft Only label. The mark is as shown in Figure 7.1.C of the IATA Dangerous Goods Regulations. The border of the mark must have red diagonal hatchings with a minimum width of 5mm. The symbol (group of batteries, one damaged and emitting flame, above the UN number for lithium ion or lithium metal batteries or cells) must be black on white or suitable contrasting background. The lithium battery mark may be printed directly on the outer packaging provided that there is sufficient contrast between the elements of the lithium battery mark and the colour of the packaging material. The mark must be in the form of a rectangle or a square with minimum dimensions of 100 mm x 100 mm. If the size of the package so requires, the dimensions/line thickness may be reduced to not less than 100 mm wide x 70 mm high.

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* Place for UN number(s), i.e. UN 3090, UN 3091, UN 3480 and/or UN 3481, as applicable. The UN number(s) indicated on the mark should be at least 12 mm high.

** Place for telephone number

Note:

The telephone number should be of a person knowledgeable about the shipment but is not intended to be for the purposes of obtaining immediate emergency response guidance and is therefore not required to be monitored at all times that the package is in transit. It is acceptable for the number to be monitored during the company's normal business hours in order to provide product-specific information relative to the shipment. However, it also is acceptable to use an emergency response, 24-hour phone number on the lithium battery mark.

△ E. If I have smaller packages, can I use a smaller lithium battery mark?

Where the packages are of dimensions such that they cannot bear the full-size lithium battery mark, the mark dimensions may be reduced to 100 mm wide × 70 mm high. The design specifications remain otherwise the same.

Where any face of a package is large enough to bear the full-size lithium battery mark, the full-size mark must be used.

F. When is a lithium battery mark not required on the package?

A lithium battery mark must not be affixed to packages prepared in accordance with Section IA of Packing Instructions 965 and 968 and Section I of Packing Instructions 966, 967, 969 and 970.

A lithium battery mark is not **required** for packages prepared in accordance with Section II of PI 967 or PI 970 containing only button cell batteries installed in equipment (including circuit boards) or consignments of two packages or less where each package contains no more than four cells, or two batteries installed in equipment.

Note:

The Air Waybill is required to contain the statements "Lithium [ion or metal] batteries in compliance with Section II of PI9XX" when the lithium battery mark is affixed to the package(s).

G. Section II in Packing Instructions 967 and 970 states that “the lithium battery mark is not required on consignments of two packages or less where each package contains no more than four cells, or two batteries installed in equipment.” What is the intent of this provision?

This provision is to require, where there are more than two packages in the consignment, that each package bears the lithium battery mark, and therefore the air waybill has the compliance statement e.g. “Lithium [ion or metal] batteries in compliance with Section II of PI 9xx [67 or 70]”.

The provision continues to allow for small consignments of one or two packages containing no more than four cells or two batteries installed in equipment per package to move without the lithium battery mark and therefore without the compliance statement on the air waybill.

Note:

A consignment is one or more packages of dangerous goods accepted by an operator (airline) from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address.

H. I have an MP3 player that contains one single-cell lithium ion battery. Do I have to mark the shipping box that contains each MP3 player? What if I place five MP3 players in a shipping box? Does this require the lithium battery mark?

For packages of a single MP3 player, no lithium battery mark would be required since you can place up to 4 of these single-cell batteries in a box without applying the lithium battery mark on the outer box. In the case where 5 MP3 players are in a shipping package, a lithium battery mark on the shipping package is required.

I. Can a single lithium battery mark be used to identify that both lithium metal and lithium ion batteries are contained inside the package?

Yes. The mark may bear all applicable UN numbers, e.g. UN 3091, UN 3481, to identify that the package contains lithium metal batteries packed with or contained in equipment and lithium ion batteries packed with, or contained in equipment.

J. What are the requirements for the telephone number on the lithium battery mark?

The telephone number should be of a person knowledgeable about the shipment but is not intended to be for the purposes of obtaining immediate emergency response guidance and is therefore not required to be monitored at all times that the package is in transit. It is acceptable for the number to be monitored during the company's normal business hours in order to provide product-specific information relative to the shipment. However, it also is acceptable to use an emergency response, 24-hour phone number on the lithium battery mark.

K. Must the lithium battery mark be placed on the same face of the package with the Class 9 hazard label and/or Cargo Aircraft Only label?

No, the lithium battery mark does not have to be on the same face of the package with these labels. It may be placed on a different face. However, if the package is of sufficient size all required marks and labels should be applied to one face of the package.

L. For the purposes of the lithium battery packing instructions, what is considered the “package”?

The package is the complete product of the packing operation that satisfies the requirements of the packing instruction and in a manner ready to be presented for transport (shipper/consignee information, hazard communication, etc.). The package may contain multiple batteries or pieces of equipment provided the limitations set out in the applicable packing instruction are not exceeded. The package must be marked and labelled as required by the packing instruction. A single package may be offered for transport, or one or more packages may then be placed into an overpack for ease of handling or transport purposes. When an overpack is used, the package marks and labels must be

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duplicated on the overpack unless the marks and labels required on individual packages are visible or are not required by the packing instruction (i.e. not more than 4 cells or 2 batteries when contained in equipment and no more than two packages in the consignment).

M. Does the IATA DGR require a MSDS or SDS containing the UN test data?

No. The IATA DGR does not require a safety data sheet (SDS) when offering lithium batteries for transport.

Notes:

1. *A SDS is not a transport document. A SDS is only required for the supply and use of a substance or mixture meeting the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) classification criteria. GHS does not include provisions for manufactured articles.*
2. *Manufacturers and subsequent distributors of lithium cells and batteries and equipment with installed lithium cells or batteries must make available a test summary that identifies that the cell and battery types have passed the applicable UN 38.3 tests, see Part 4 of this document.*

N. Under Packing Instructions 966 and 969, it states that “The maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spare sets. A “set” of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment”. If a package contains 4 power tools (each tool contains 1 lithium ion battery), can 2 extra lithium ion batteries be placed in the package for each piece of equipment for a total of 12 batteries?

Yes, providing you do not exceed the maximum net quantity for the relevant section of the packing instruction and the chosen aircraft type. The 12 batteries reflect two spare sets (8) for each of the 4 power tools in the outer package plus one each to power the device (4).

O. May lithium battery packages be placed in an overpack in accordance with the IATA Dangerous Goods Regulations?

Yes, but there are segregation requirements that need to be considered for certain other classes of dangerous goods. UN 3090, lithium metal batteries prepared in accordance with Section IA or Section IB of PI 968 and UN 3480, lithium ion batteries prepared in accordance with Section IA or Section IB of PI 965 are not permitted in the same outer packaging with dangerous goods classified in Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1. The overpack may also contain goods not subject to the Regulations provided there are no packages enclosing different substances which might react dangerously with each other. An overpack must be marked with the word “overpack” and must be labelled with the lithium battery mark (DGR Figure 7.1.C), unless the mark(s) on the package(s) inside the overpack are visible or not required by the Packing Instruction.

In addition, the word “overpack” must be marked on overpacks containing packages transported in accordance with Section I of the applicable Packing Instructions (i.e. bearing the Class 9 lithium battery hazard label).

Note:

For Section II of PI 965 and PI 968 the shipper is limited to one (1) package per consignment (shipment) and no more than one (1) package complying with the requirements of Section II may be placed in an overpack. This overpack may also contain packages of non-dangerous goods and/or packages prepared in accordance with Section IA and/or IB of PI 965 and/or PI 968 and/or packages of other dangerous goods, excluding packages containing dangerous goods classified in Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1.

P. Do the quantity limits shown in the lithium battery packing instructions apply to overpacks containing lithium batteries?

The quantity limits shown in the packing instructions refer to the maximum net weight of the lithium cells or batteries that is permitted in each package. Provided each package remains within the limit specified in the packing instruction, there are no limits specified for an overpack.

Note:

For Section II of PI 965 and PI 968 the shipper is limited to one (1) package per consignment (shipment) and no more than one (1) package complying with the requirements of Section II may be placed in an overpack. This overpack may also contain packages of non-dangerous goods and/or packages prepared in accordance with Section IA and/or IB of PI 965 and/or PI 968 and/or packages of other dangerous goods, excluding packages containing dangerous goods classified in Class 1 other than Division 1.4S, Division 2.1, Class 3, Division 4.1 or Division 5.1.

Q. Packing Instructions 966 and 969 Section II include a requirement for a 1.2 metre drop test. What portion or portions of the package are subject to this test?

The completed package containing batteries as prepared for transport in accordance with the relevant packing instruction must be capable of withstanding the 1.2 m drop test. This could apply to a package solely containing batteries that is packaged in full compliance with the provisions of the packing instruction (to include the 1.2 m drop test capability requirement) and is then packed with equipment in a strong rigid outer packaging and offered for transport (see item 2N for additional information related to overpacks). Or, it could apply to a package that includes batteries properly packed in inner packaging and equipment or other non-dangerous goods that are placed in a strong rigid outer packaging. The package that includes both the inner packaging containing batteries and the equipment must comply with the packing instruction to include meeting the capability to pass the 1.2 m drop test.

△ R. How do I transport prototype lithium cells and batteries that have not passed the UN 38.3 Tests?

Pre-production prototypes of lithium batteries or cells, when these prototypes are transported for testing, or low-production runs (i.e. annual production runs consisting of no more than 100 lithium cells and batteries) of lithium cells or batteries that have not been tested to the requirements in subsection 38.3 of the UN Manual of Tests and Criteria may be transported aboard cargo aircraft, if approved by the appropriate authorities of the State of origin and the State of the operator and the requirements in Packing Instruction 910 of the Supplement to the Technical Instructions are met (see Special Provision A88).

The appropriate authority of the State of origin should provide details of PI 910 as part of the approval process.

S. Can I ship recalled, damaged or non-conforming cells or batteries?

Lithium batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport by air (e.g. those being returned to the manufacturer for safety reasons). This applies also to lithium cells or batteries installed inside equipment such as mobile phones, laptops or tablets where the devices are subject to recall due to the safety concerns of the lithium cell or battery installed in the device, see Special Provision A154 in the DGR.

Batteries which have some other defective feature (e.g. LEDs not showing charge, incorrect model number on label, or batteries not holding enough charge) could still be shipped by air. Also, laptops being returned may not have a defective battery, it may not meet the needs of the customer, may be defective itself (but not the battery), etc. In these situations air transport would be permitted. The

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battery or equipment manufacturer should be contacted to determine the appropriate shipping method.

T. How do I protect against “inadvertent activation”?

When batteries are contained in equipment, the equipment must be packaged in a manner that prevents unintentional activation or must have an independent means of preventing unintentional activation (e.g. packaging restricts access to activation switch, switch caps or locks, recessed switches, trigger locks, temperature sensitive circuit breakers, etc.). This requirement does not apply to devices which are intentionally active in transport (RFID transmitters, watches, sensors etc.) and which are not capable of generating a quantity of heat sufficient to be dangerous to packaging or personal safety.

U. What is the maximum weight of batteries per package for fully regulated batteries contained in equipment (Section I)?

The maximum weight is 5 kg of lithium batteries per package for passenger and cargo aircraft and 35 kg of lithium batteries per package for cargo aircraft only. The net quantity shown excludes the weight of the equipment:

	Net Quantity per Package Passenger Aircraft	Net Quantity per Package Cargo Aircraft Only
Lithium Ion & Lithium Metal cells and batteries contained in equipment	5 kg	35 kg

V. Do I need to declare a gross weight or a net weight for lithium batteries (Section I)?

All lithium battery shipments, including when packed with or contained in equipment, must be declared by the net weight of lithium cells or batteries contained in the package as per the definition of “net quantity”, see page 3.

W. I have 2 kg of 2.7Wh cells and 2 batteries that meet the Section II limitations; can I place them in one package?

No. The limits found in Table 965-II and Table 968-II cannot be combined. Shippers are not permitted to ship more than one package of Section II PI 965 at one time. Therefore quantities of lithium ion cells or batteries that exceed the limit for one package must be shipped as Section IB of the applicable packing instruction.

X. I am shipping Section IB lithium [ion or metal] batteries; do I need dangerous goods training?

Yes. All the provisions of the Dangerous Goods Regulations apply to shipments of Section IB batteries except the references listed in Section IB. Therefore, dangerous goods training as indicated in Subsection 1.5 of the Dangerous Goods Regulations is required.

Y. What are the additional marking requirements for a package prepared under Section IB of Packing Instruction 965 and 968?

Because all of the requirements of the dangerous goods regulations apply other than the requirement to use UN specification packaging, each package must be marked with:

- the UN Number preceded by “UN” and the Proper Shipping Name (DGR 7.1.4.1 (a));
- the shipper and consignee address (DGR 7.1.4.1 (b));
- in addition, the net weight as required by (DGR 7.1.4.1(c)) must be marked on the package; and

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- the lithium battery mark (see item 2D) in addition to the Class 9 lithium battery hazard label and Cargo Aircraft Only label.

Note:

When using an overpack, each package must be marked in accordance with the Regulations and then, when placed in an overpack, marked as required by DGR 7.1.7.

Z. I am shipping perishable cargo with lithium battery powered temperature or data loggers; do I need to follow the Dangerous Goods Regulations?

Yes. All the applicable provisions for lithium batteries will need to be followed by the shipper of such devices, including the limitations for devices that are "active" (on) during transport.

Note:

1. The IATA [Temperature Control Regulations](#) (TCR) also apply to such shipments.
2. Further information on active devices in the guidance document that is posted on the IATA website – www.iata.org/pharma

AA. Do I need to include an additional document or statement to certify that my lithium ion batteries are at no more than 30% SoC?

No. For lithium ion batteries shipped in accordance with Section IA or Section IB of PI 965, which must be on a Shipper's Declaration, the Shipper's Declaration includes a certification statement "I declare that all of the applicable air transport requirements have been met."

By signing the Shipper's Declaration the shipper is making a legal statement that all the applicable provisions of the DGR have been complied with, which includes that the lithium ion batteries are at no more than 30% SoC.

For Section II of PI 965, the provision of the compliance statement "lithium ion batteries in compliance with Section II of PI 965" on the air waybill will be taken by regulatory authorities as a legal declaration of compliance.

BB. I have lithium ion batteries packed with equipment (PI 966, Section I) where the lithium ion batteries are packed in a UN specification fibreboard (4G) box and then that box is packed with the equipment in a fibreboard outer packaging. Is this an overpack?

No, Section I of PI 966 (and also PI 969) allows two methods of having lithium batteries packed with equipment. Either:

- (a) the lithium batteries are packed into a UN specification packaging meeting Packing Group II performance standards and then packed with the equipment in an outer packaging; or
- (b) the lithium batteries and the equipment are packed into a UN specification packaging meeting Packing Group II performance standards.

In either case what is presented for transport is a "package" and not an overpack.

CC. Does the definition of "consignment" apply to the house air waybill (HAWB) or to the master air waybill (MAWB)?

The use of HAWB or MAWB has no direct relationship to what is a "consignment". For example a MAWB may have multiple consignments where each of the consignments are from separate shippers, or are from one shipper but to separate consignees, or the MAWB may be just be a single consignment from one shipper to one consignee.

The following limitations apply to consignments:

1. a shipper is not permitted to consign more than one package of Section II, PI 965 or PI 968; and

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2. a shipper is not permitted to consign more than two packages of lithium batteries contained in equipment under Section II of PI 967 and PI 970 where there are no more than 4 cells or 2 batteries in the package without the application of the lithium battery mark on the package.

The objective of these two conditions is to:

1. restrict the number of packages of just lithium batteries that are carried by air that are not subject to the dangerous goods acceptance check and that are not shown on the written information to the pilot-in-command. The intention here is to force shippers of multiple packages to declare these on a Shipper's Declaration for Dangerous Goods and therefore make the consignment subject to the full checks for air transport.
2. require appropriate hazard communication on packages and on the air waybill where a shipper has more than two packages of lithium batteries contained in equipment.

Notes:

1. *This does not mean that every retail "package" must bear the lithium battery mark. A shipper may place multiple retail boxes, each containing a lithium battery meeting Section II installed in equipment, into an outer packaging to form the package for air transport. There is no limit on the number of individual retail boxes that can be placed into the outer packaging, except that a "package" must not contain more than 5 kg net weight of lithium batteries. Each such package must bear the lithium battery mark and when an air waybill is used, the air waybill must show the applicable compliance statement, e.g. "lithium ion batteries in compliance with section II of PI 967".*
2. *Shippers or freight forwarders should not try to split a consignment across multiple air waybills to try to avoid the application of the lithium battery mark where there are more than two packages with lithium batteries contained in equipment under Section II in a consignment.*

DD. Can I ship 2 mobile phones in the same package with 2 power banks using the Section II provisions?

No, the power banks are classified as UN 3480, **Lithium ion batteries**. Under the provisions of PI965 Section II other dangerous goods are not permitted in the same outer packaging. The power banks are also not considered as "spares" for the purposes of PI 966 and Lithium ion batteries packed with equipment.

EE. What is the correct classification for hearing aids or Bluetooth® "earbuds" that are shipped in a charging case or with a charging case in the same package?

Bluetooth® earbuds or hearing aids that are shipped in or with a charging case should be classified as "UN3481, Lithium batteries packed with equipment" and packaged in accordance with PI 966. If the charging case is shipped without the earbuds, the case must be classified as "UN3480, Lithium ion batteries" and packaged in accordance with PI 965.

□ FF. Can a package containing an AC adaptor or charger and lithium ion batteries be classified as UN 3481, Lithium ion batteries packed with equipment?

No, for the purpose of Packing Instruction 966, "equipment" means the device or apparatus for which the lithium ion batteries will provide electrical power for its operation. When a package contains only the AC adaptor or charger and lithium ion batteries, the package must be classified as "UN 3480, Lithium ion batteries" and packaged in accordance with PI 965.

Part 3 – Questions Related to Design Type Testing Provisions**A. Where can I find requirements related to testing of battery design types?**

The UN Manual of Tests and Criteria sets out specific tests that must be conducted on each lithium cell or battery design type. Each test is intended to either simulate a common transportation occurrence such as vibration or changes in altitude or to test the integrity of a cell or battery. You may obtain a copy of these testing requirements via the following website:

http://www.unece.org/trans/danger/publi/manual/manual_e.html

B. What constitutes a design change requiring renewed design type testing?

The following provisions are taken from the 7th revised edition of the UN Manual of Tests and Criteria, paragraph 38.3.2.2.

A cell or battery that differs from a tested design by:

- (a) For primary cells and batteries, a change of more than 0.1 g or 20% by mass, whichever is greater, to the cathode, to the anode, or to the electrolyte;
- (b) For rechargeable cells and batteries, a change in Watt-hours of more than 20% or an increase in voltage of more than 20%; or
- (c) A change that would materially affect the test results.

shall be considered a new type and shall be subjected to the required tests.

Note: the type of change that might be considered to differ from a tested type, such that it might lead to a failure of any of the test results, may include, but is not limited to:

- (a) A change in the material of the anode, the cathode, the separator or the electrolyte;*
- (b) A change of protective devices, including the hardware and software;*
- (c) A change of safety design in cells or batteries, such as a venting valve;*
- (d) A change in the number of component cells;*
- (e) A change in connection mode of component cells;*
- (f) For batteries which are to be tested according to T.4 with a peak acceleration less than 150 g_n, a change in the mass which could adversely impact the result of the T.4 test and lead to a failure.*

In the event that a cell or battery type does not meet one or more of the test requirements, steps shall be taken to correct the deficiency or deficiencies that caused the failure before such a cell or battery type is retested.

C. What edition of the UN Manual of Tests and Criteria must be used when testing new lithium cell or battery designs

If a newly produced lithium cell or battery design is being tested for the first time, then the edition of the UN *Manual of Tests and Criteria* in effect at the time that the cell or battery designs are first tested must be used. For example, a new lithium ion battery design is produced for the first time in March 2019. This battery must be tested in accordance with the provisions of the 6th revised edition and amendment 1 of the UN *Manual of Tests and Criteria* as this is the edition in effect, see Note under DGR 1.1.1 (1.1 of the LBSG).

Part 4 – Questions Related to the Lithium Battery Test Summary¹

A. Does the test summary apply to equipment containing lithium cells or batteries?

Yes, the test summary applies to all lithium cells and batteries, including button cells, irrespective of whether they are shipped alone or contained in equipment.

B. Can multiple batteries/manufacturers/products be listed on one report?

Yes, it is acceptable to have a single document that addresses multiple batteries / manufacturers / products, provided all required information is stated. For example, a tablet manufacturer may purchase lithium ion batteries from three different battery manufacturers. The test summary for the product will therefore list batteries and all related information (e.g. Watt-hours, test labs) from the three battery manufacturers without naming the manufacturer due to confidentiality issues.

C. Is it acceptable to list the various test houses, tests and range of revisions tested to for the UN 38.3 revision and amendments?

Yes, it is acceptable to have multiple test houses and their addresses, email information, etc. listed provided all required information is stated. The test house is not required to be aligned to a specific battery or product on the test summary when the test summary covers multiple batteries/products. It is required to have the test report number and date of test for each cell/battery/product listed on the test summary.

D. What is meant by physical description of cell or battery?

A physical description is intended to provide a check for the person requesting the test summary to know that it applies to the cell/battery/product covered by the test summary, i.e. if a cellular phone is the product being shipped, the invoice description or marketing name of the product as the physical description could be used on the test summary.

E. What does availability of report mean: "When requested?"

The test summary must be made available upon request. Any individual or entity in the supply chain may request the test summary, e.g. regulator, consumer, or transport provider.

F. Can the test summary provider require a requestor to obtain the document from a website?

Yes, it is acceptable for the provider to require the requestor to obtain a document electronically from a provider's website. The provider must ensure that the cell/battery/product has appropriate identifiers to align to the test summary.

G. If a manufacturer considers their suppliers, test house and battery data confidential and competitive information, how would test summary compliance be achieved?

All 10 data elements and listed subsets of information are required to be on the test summary. As indicated above, the test house information may be listed to cover a range of products.

H. If a test summary is requested by a dangerous goods enforcement agency, how quickly must the test summary be made available? For example, would a manufacturer be expected to immediately produce a test summary or provide it within a certain amount of time (e.g. 72 hours)

Due to the large volume of lithium batteries and lithium battery powered products that are shipped daily, manufacturers and distributors should not be expected to immediately provide a test summary for every product they ship. Manufacturers and distributors should be provided a reasonable amount of time to provide the required test summary.

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I. Would manufacturers and distributors of battery powered vehicles (UN3171) and hybrid vehicles containing a lithium battery (UN3166) be expected to provide a test summary?

Yes. The test summary requirement applies to manufacturers and distributors of lithium cells and batteries. Therefore, a test summary must be made available for battery-powered vehicles and other vehicles containing lithium batteries.

J. Is there a mandated format for the test summary that manufacturers and distributors must follow?

No. Manufacturers and distributors may compile the information required in the test summary using any format. Below are 3 examples of a test summary:

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Example 1 of a Lithium Ion Battery Test Summary**LITHIUM CELLS OR BATTERIES TEST SUMMARY
IN ACCORDANCE WITH SUB-SECTION 38.3
OF UN MANUAL OF TESTS AND CRITERIA**Revision Date: March 27, 2017 Revision Number: 001Product Manufacturer: Beta Bell Phone Company
123 Beta Bell Lane
Bellweather, Arizona 99999Telephone: 800-999-4545
Email: betabell@gmail.com
Web: www.betabell.com

Beta Bell's product lithium ion cells and batteries have been successfully tested and comply with the UN Model Regulations, Manual of Test and Criteria, Part III, subsection 38.3.

PERFORMED TESTS			RESULTS
38.3.4.1	T1	Altitude Simulation	Pass
38.3.4.2	T2	Thermal Test	Pass
38.3.4.3	T3	Vibration	Pass
38.3.4.4	T4	Shock	Pass
38.3.4.5	T5	External Short Circuit	Pass
38.3.4.6	T6	Impact / Crush	Pass
38.3.4.7	T7	Overcharge	Pass
38.3.4.8	T8	Forced Discharge	Pass

The UN38.3 tests were performed by one of the following test houses and were tested to UN Manual Test and Criteria Revision 3 Amendment 1 or subsequent revisions or amendments.

Test House A 123 Alpha Street Shanghai China E: testhousea@gmail.com T: 086-0310-04566 U: www.testhousea.com	Test House C 123 Chi Street Shanghai China E: testhouseC@gmail.com T: 086-0310-04588 U: www.testhousec.com
Test House B 123 Beta Street Shanghai China E: testhouseb@gmail.com T: 086-0310-04577 U: www.testhouseb.com	Test House D 123 Delta Street Shanghai China E: testhoused@gmail.com T: 086-0310-04599 U: www.testhoused.com

**LITHIUM CELLS OR BATTERIES TEST SUMMARY
IN ACCORDANCE WITH SUB-SECTION 38.3
OF UN MANUAL OF TESTS AND CRITERIA**

Product Test Information

Model numbers	Physical Description	Battery weight (kg) Mass	Wh rating	Test report number	Test report date
BB12389	Li ion polymer Cell phone Alpha A	0.035	6.25	RTS123, NMD456PO98 N4569-2 BN890A	03.02.2010 03.07.2010 03.10.2010 03.15.2010
BB12450	Li ion polymer Cell Phone Beta B	0.090	6.76	TYh765-KL-09 567-908HGT	08.09.2012 09.01.2012
BB67896	Li ion polymer Cell phone Chi C	0.026	5.25	89065RT-90 NHI-kl09	07.07.2010 07.04.2010
etc					
etc					
etc					
etc					
etc					
etc					

Signature

Name, Title

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Example 2 of a Lithium Ion Battery Test Summary

	UN38.3 Lithium Battery Test Summary for GreenTech Tablet Model No. T54321
1	Battery Manufacturer <i>Confidential and Proprietary GreenTech Information</i>
2	Product Manufacturer GreenTech 123 Main Street Annapolis, MD 21012 888.111.2345 contact@greentech.com; www1.greentech.com
3	UN38.3 Test Lab Bob's Battery Test Lab 1600 Pennsylvania Avenue Smithfield, VA 12345 Phone: 211.789.2345 bob@testlab.org; www.testlab.org
4	Test Report Number Liion621345
5	Date of Test Report April 1, 2017
6	Description of Cell or Battery 7.4 V, 1800 mAh, 13.32 Wh Li ion battery, Model No. P1789 Small, rectangular plastic case, 100 grams
7	UN38.3 Tests Performed and Successfully Passed T.1, T.2, T.3, T.4, T.5, and T.7. (Note that T.6 and T.8 are not applicable to batteries.)
8	Assembled Battery Testing Requirements Not Applicable
9	Edition of UN Manual of Tests and Criteria Used Sixth Revised Edition
10	Name and Title of Signatory <i>Jason Alexander</i> Jason Alexander GreenTech Staff Engineer

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Example 3 of a Lithium Metal Cell Test Summary

LITHIUM CELLS OR BATTERIES TEST SUMMARY IN ACCORDANCE WITH SUB-SECTION 38.3 OF MANUAL OF TESTS AND CRITERIA		
BATTERY TRANSPORTATION INFORMATION		
Name of cell, battery or product manufacturer, as applicable: Item Number : 4A23123 Item Name : Battery Alpha Prime Item Description : Lithium Metal Battery (Primary)	Cell, battery or product manufacturer's contact information to include address, phone number, email address and website for more information: Manufacturer XYZ 3480 Lithium cells Rd Lithiumionville, CA 98765 United States (+1-987) 987-6543 email@xyz.com	
Name of the test laboratory to include address, phone number, email address and website for more information: Test Lab A 1919 Alpha St Testcity, IA 55555 USA (+1-333) 555-1122 email@testlab.com	A unique test report identification number: ABC12345	Date of the test report: 03-Apr-2013
Description of cell or battery to include at a minimum: Lithium ion or Lithium metal cell or battery; Mass; Watt-hour rating, or lithium content; Physical description of the cell/battery; and Model numbers: Battery used in consumer power tools Cell/battery Type : Lithium metal Cell or Battery : Cell LC or W/h rating : LC (g): >0.3 <= 1 Cell or Battery Weight : 12.00 Grams	List of tests conducted and results (i.e., pass/fail): Test T.1: Altitude Simulation : Pass Test T.2: Thermal Test : Pass Test T.3: Vibration : Pass Test T.4: Shock : Pass Test T.5: External short circuit : Pass Test T.6: Impact/Crush : Pass Test T.7: Overcharge : Not applicable Test T.8: Forced discharge : Pass Testing additional comments:	
Reference to assembled battery testing requirements, if applicable (i.e., 38.3.3(f) and 38.3.3(g)): Not applicable	Reference to the revised edition of the Manual of Tests and Criteria used and to amendments thereto, if any: Revision 5	For air transport only: Does the cell or battery comply with the 30% State of Charge? Not Applicable
PRODUCT CLASSIFICATION FOR TRANSPORT (According to UN - DGP)		
UN Classification: UN 3090	Proper Shipping Name: Lithium metal batteries	
Signature with name and title of signatory as an indication of the validity of information provided: Wayne Purple Testing Manager	This document remains valid as long as no changes, modifications, or additions are made to the model(s) described in this document, after being transported from a Manufacturer XYZ facility. The model(s) has (have) been classified according to the applicable transport regulations and the UN Manual of Tests and Criteria as of the date of the certification. The model(s) must be packaged, labeled, and documented according to country and other international regulations for transportation.	
Date document was generated: 04-Mar-2017 11:49 am		

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¹ Information in Part 4 kindly provided by PRBA – The Rechargeable Battery Association, RECHARGE the Advanced Rechargeable & Lithium Batteries Association and the Medical Device Battery Transport Council

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Additional Information

Further information can be found here:

<http://www.iata.org/lithiumbatteries>

Information for passengers can be found here:

<http://www.iata.org/dgr-guidance>

www.faa.gov/go/safecargo

You may also contact the airline of your choice or your national civil aviation authority if you have any further concerns about travelling with lithium metal or lithium ion batteries.

You can also contact the IATA Dangerous Goods Support team if you have questions or concerns which may not have been addressed in this document: dangood@iata.org.

Abbreviations, Acronyms, Symbols

The following abbreviations, acronyms and symbols are used throughout the document.

Abbreviation	Meaning
A/C	Aircraft
Li Ion (li-ion)	Lithium ion
Li batt.	Lithium battery
Pax	Passenger
Acronym	Meaning
CAO	Cargo Aircraft Only
DGD	Shipper's Declaration for Dangerous Goods
DGR	IATA Dangerous Goods Regulations
LBSG	IATA Lithium Battery Shipping Guidelines
Symbol	Meaning
≥	Equal to or greater than
≤	Equal to or less than
>	Greater than
<	Less than
□	Addition of an item
△	Change to an item
⊗	Deletion of an item



文件编号:

版 本:

锂离子聚合物电池规格书

Li-ion polymer battery specification

型号规格 Model SPEC	1166110
标称容量 Nominal Capacity	10000mAh
客户 Customer	

编制 Registered	审核 Checked	质量确认 QA	批准 Approved

客户确认 Customer Approved
公司全称: Company Name:
签名: Signature:
部门: Department:
公司印章: Company Stamp:

*** 受控文件禁止影印、翻印。未经许可，不得对外扩散 ***

地址: 江西省抚州市高新区文昌大道迪比科产业园 邮编 Postalcode: 344000

ADD: DBK Ind Park, High Tech Industrial Park, Wenchang road, Fuzhou, Jiangxi.

电话 Tel: 0086-794-7808888 传真 Fax: 0086-794-7808889

CONFIDENTIAL

1
BELKIN_000145



变更履历表

Modified List

版本 Revision	日期 Date	变更内容 Modified content	批准 Approve
A0	2017-3-17	新版发行 New Release	



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地址：江西省抚州市高新区文昌大道迪比科产业园 邮编 Postalcode: 344000

ADD: DBK Ind Park, High Tech Industrial Park, Wenchang road, Fuzhou, Jiangxi.

电话 Tel: 0086-794-7808888 传真 Fax: 0086-794-7808889

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3
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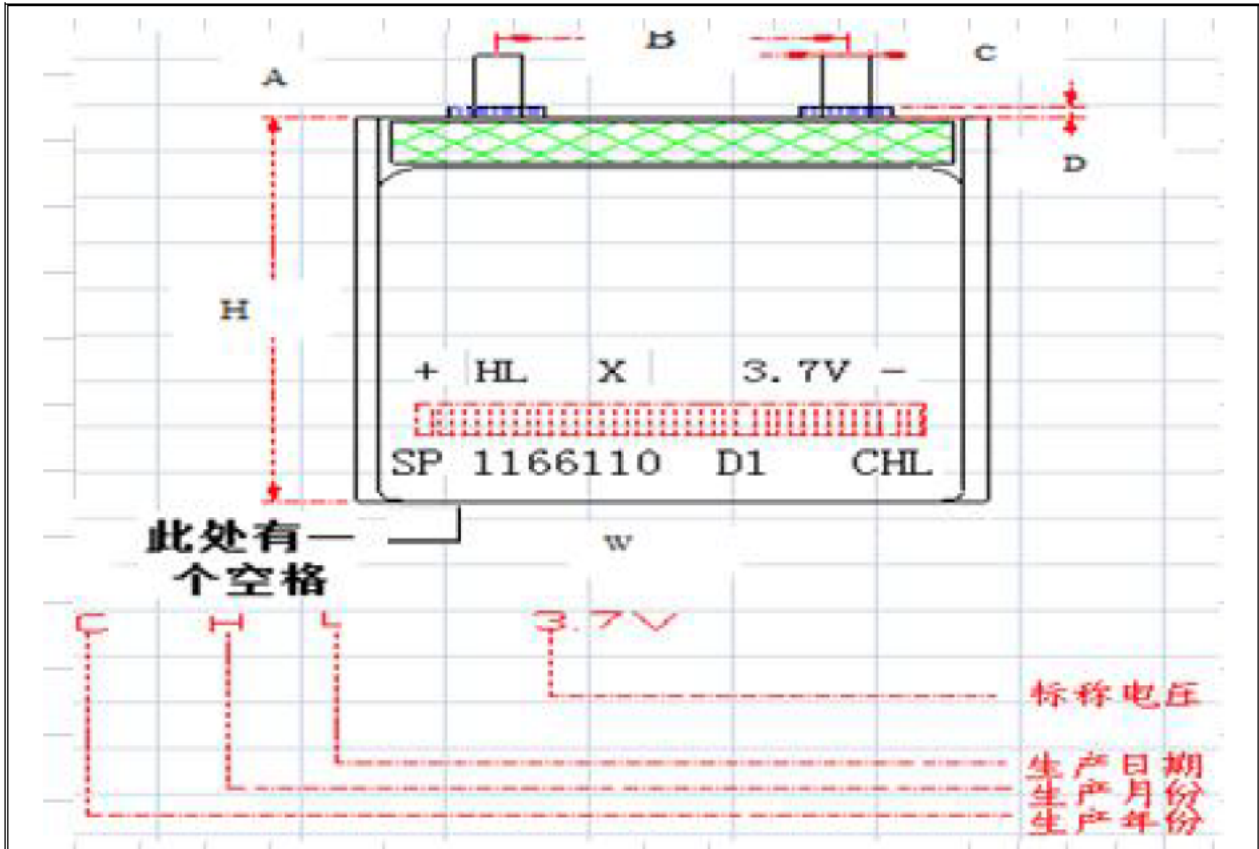


1. 适用范围 Scope

本标准描述了聚合物锂离子电池的基本性能、技术要求、测试方法及注意事项。本标准只适用于江西迪比科股份有限公司所生产的锂聚合电池。参照 GB31241-2014,GB/T18287-2013。

This specification describes the basic performance, technical requirement, testing method, warning and caution of the Li-ion polymer rechargeable battery. The specification only applies to JIANGXI DBK CO., LTD. Reference GB31241-2014,GB/T18287-2013.

2. 电芯尺寸图 Drawing of Cell



项目 Item	描述 Description	尺寸 Dimension
T (厚度)	Cell Thickness (Initial)	≤10.6mm
W (宽度)	Cell Width	66.0mm max
H (高度)	Cell Height	110.mm max
A (极耳长度)	Cell Tab length	10±1.0mm
B (极耳中心距)	Cell Tab center distance	40.0±2mm
C (极耳宽度)	Cell Tab width	6.0±0.1mm
D (极耳胶长度)	Cell Top sealant length	0.2-2.0 mm



3. 主要技术参数 Technical Specification

序号 NO.	项目 Item	规格 Specifications	
3.1	最小容量 Minimum Capacity	10000mAh	0.2C 充电, 0.2C 放电至终止电压 2.8V 0.2C charge and discharge to 2.8V cut-off
3.2	典型容量 Typical Capacity	10100mAh	
3.3	标称电压 Nominal Voltage	3.70V	
	出货电压 Shipment Voltage	3.65-3.75V	
3.4	标准充电方式 Standard Charging Method	23±2℃ 0.2C 恒流恒压充电至 4.20V, 截止电流 0.02C 23±2℃ 0.2C CC/CV to 4.20V ,end current 0.02C	
3.5	充电电流 Charge Current	标准充电:0.2C Standard charge: 0.2C	
		快速充电:0.5C Rapid charge:0.5C	
3.6	充电时间 Charge Time	标准充电: 360min Standard Charge: 360min	
		快速充电(恒压): 180min Rapid Charge (Constant Voltage):180min	
3.7	充电截止电压 Charge Cut off Voltage	4.20V	
3.8	放电截止电压 Discharge Cut off Voltage	2.8V	
3.9	标准放电 Standard Discharge	0.2C 恒流放电至 2.8V 0.2C Constant Current Discharge to 2.8V	
3.10	最大连续放电电流 Max. Discharge Current	1.0C	
3.11	最大瞬间放电电流 Max. Pulse Discharge	3.0C (≤4S)	
3.12	3.6V 放电平台时间 3.6V Discharge platform time	≥60min(0.5C)	
3.13	内阻 Internal Impedance	≤60 mΩ	标准充电后 AC 1KHz 测试 AC 1KHz after standard charge
3.14	电池重量 Cell Weight	154.19±5g (Not include PCB)	
3.15	体积能量密度 Volume Energy Density	480.79wh/L	

地址: 江西省抚州市高新区文昌大道迪比科产业园 邮编 Postalcode: 344000

ADD: DBK Ind Park, High Tech Industrial Park, Wenchang road, Fuzhou, Jiangxi.

电话 Tel: 0086-794-7808888 传真 Fax: 0086-794-7808889



4. 安全规格 Safety Specification

序号 NO.	项目 Item		规格 Specifications
4.1	最大连续充电电流 Max. Charging Current		0.2C（10℃～15℃） 0.5C（15℃～40℃）
4.2	工作温度 Operating Temperature	充电 Charge	10℃～15℃ 0.2C 恒流恒压充电至 4.20V,截止电流 0.02C 10℃～15℃ 0.2C CC/CV to 4.20V , cutoff current 0.02C 15℃～40℃ 0.5C 恒流恒压充电至 4.20V,截止电流 0.02C 15℃～40℃ 0.5C CC/CV to 4.20V , cutoff current 0.02C
		放电 Discharge	-20℃～60℃
4.3	运输贮存条件 Storage& Transportation Condition	-20℃～50℃	小于一个月 Less than 1 month
		-20℃～40℃	小于三个月 Less than 3 months
		-20℃～25℃	小于一年 Less than 1 year
		湿度 Humidity	MAX.90%RH
		推荐存储：20℃±10℃，50%电量，电池每六个月循环充放电一次。 Recommended Storage Condition: 20℃±10℃, 50%SOC, cells should cycle once in six months.	

5. 电池外观及测试 Appearance And Measurement

5.1 外观 Appearance

电池表面清洁, 无电解液泄漏, 无明显的划痕及机械损伤, 无鼓胀, 无影响电池价值的其它外观缺陷。
There shall be no such defect as leakage, deep scratch, crack, swelling, which may adversely affect commercial value of the cell.

5.2 测试设备要求 Test Equipment Requirements

(1) 尺寸测量设备 Dimension Measuring Instrument

测量尺寸的仪器的精度不小于 0.01mm

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

(2) 电压表 Voltmeter

国家标准或更灵敏等级, 内阻不小于 10 KΩ/V。

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10KΩ/V.

(3) 电流表 Ammeter

国家标准或更灵敏等级, 外部总内阻包括电流表和导线应小于 0.01Ω。

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω.

(4) 内阻测试仪 Impedance Meter

内阻测试仪测试方法为交流阻抗法 (AC 1kHz LCR)。

Impedance shall be measured by a sinusoidal alternating current method (AC 1kHz LCR meter).

地址: 江西省抚州市高新区文昌大道迪比科产业园 邮编 Postalcode: 344000

ADD: DBK Ind Park, High Tech Industrial Park, Wenchang road, Fuzhou, Jiangxi.

电话 Tel: 0086-794-7808888 传真 Fax: 0086-794-7808889



5.3 标准测试条件 Standard Test Condition

测试电池必须是本公司出厂时间不超过一个月的新电池，且电池未进行过五次以上充放电循环，除非其它特殊要求。

本产品规格书规定的测试环境条件为：温度 $23\pm 2^{\circ}\text{C}$ ，相对湿度 15%~85%，大气压：86~106KPa。

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of $23\pm 2^{\circ}\text{C}$ and relative humidity of 15%~85%, Atmospheric pressure: 86~106KPa.

6. 电性能 Electrochemical Performance

序号 NO.	项目 Item	测试方法和条件 Test Method and Condition	标准 Criteria
6.1	0.2C 容量 0.2C Capacity	电芯标准充电后,搁置 30 分钟,用 0.2C 电流放电至 2.8V,记录放电时间。 After standard charging, rest cell for 30min, then discharge at 0.2C to 2.8V, record the discharge time.	放电时间 $\geq 300\text{min}$ Discharge Time $\geq 300\text{min}$
6.2	0.5C 容量 0.5C Capacity	电芯标准充电后，搁置 30 分钟，然后用 0.5C 电流放电至 2.8V，记录放电时间。 After standard charging, rest cell for 30min, then discharge at 0.5C to 2.8V, record the discharge time.	放电时间 $\geq 100\text{min}$ Discharge Time $\geq 100\text{min}$
6.3	循环寿命 Cycle Life	电芯先用 0.2C 恒流充电至 4.20V，再恒压 4.20V 充电,直至充电电流 $\leq 0.02\text{C}$ ，搁置 10 分钟，再用 0.2C 电流放电至 3.0V；再搁置 10 分钟，重复以上步骤。 Constant current 0.2C charge to 4.20V, then constant voltage charge to cutoff current of 0.02C, rest for 10min, constant current 0.2C discharge to 3.0V, rest for 10min. Repeat the above steps.	400times (次) 容量保持率 $\geq 60\%$ Remaining Capacity $\geq 60\%$

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7. 贮存性能 Storage Performance

序号 NO.	项目 Item	测试方法和条件 Test Method and Condition	标准 Criteria
7.1	常温贮存 RT Storage Performance	标准充电后电池在 $20 \pm 5^\circ\text{C}$ 的环境中贮存 28 天, 测试 0.2C 放电容量 (保持容量)。 Standard charge and storage the cell at $20 \pm 5^\circ\text{C}$ for 28 days, after which measure the 0.2 C discharge capacity (remaining).	容量保持 $\geq 85\%$ Remaining Capacity $\geq 85\%$
		0.2C 循环 3 次, 测试恢复容量 (3 周循环的最大放电容量)。 0.2C cycle 3 times, measure the recovery capacity (the maximum discharge capacity of 3 cycles).	容量恢复 $\geq 90\%$ Remaining Capacity $\geq 90\%$
7.2	高温贮存 HT Storage Performance	标准充电后电池在 $55 \pm 2^\circ\text{C}$ 的环境中贮存 7 天, 测试 0.2C 放电容量 (保持容量)。 Standard charge and storage the cell at $55 \pm 2^\circ\text{C}$ for 7 days, after which measure the 0.2 C discharge capacity (remaining).	容量保持 $\geq 60\%$ Remaining Capacity $\geq 60\%$
		0.2C 循环 3 次, 测试恢复容量 (3 周循环的最大放电容量)。 0.2 C cycle 3 times, measure the recovery capacity (the maximum discharge capacity of 3 cycles).	容量恢复 $\geq 80\%$ Recovery Capacity $\geq 80\%$

8. 环境适应性 Environmental Performance

序号 NO.	项目 Item	测试方法和条件 Test Method and Condition	标准 Criteria
8.1	恒定湿热 Constant temperature and humidity test	电芯标准充电后, 测试条件如下: 温度: $40 \pm 2^\circ\text{C}$ 相对湿度: 90~95%RH 放置时间: 48 小时 电芯取出在室温下放置 2 小时, 然后以 0.2C 电流放电至终止电压。 Standard charge the cell, put it under the test condition: Temperature: $40 \pm 2^\circ\text{C}$ Relative Humidity: 90~95%RH Storage Time: 48 hours, After which cool under room temperature for 2 hours, Then 0.2C discharged to cutoff voltage.	不起火、不爆炸、不泄露。 放电容量不低于初始容量的 60%。 No Explosion、No Fire、No Leakage. Discharging capacity is not less than 60% initial capacity.

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序号 NO.	Item 项目	测试方法和条件 Test methods and condition	标准 Criteria																													
8.2	低气压 Vacuum	电芯标准充电后，将其搁置在真空箱中。真空箱密闭后，逐渐减少其内部压力至不高于 11.6kPa 并保持 6h。 Standard charge the cell, after which store it in vacuum chamber below 11.6kPa for 6 hours.	不泄漏、不破裂、不起火、不爆炸。 No Leakage、No Fluid、No Fire、No Explosion.																													
8.3	振动测试 Vibration Test	<p>电芯按标准充电后，固定在振动台上，然后按下表参数进行正弦振动测试。</p> <table><tr><th colspan="2">频率</th><th rowspan="2">振动参数</th><th rowspan="2">对数扫频循环时间 (7 Hz-200 Hz-7 Hz)</th><th rowspan="2">轴向</th><th rowspan="2">振动周期数</th></tr><tr><th>起始</th><th>至</th></tr><tr><td>$f_1=7\text{ Hz}$</td><td>f_2</td><td>$a_1=1\text{ g}_n$</td><td rowspan="4">15 min</td><td>X</td><td>12</td></tr><tr><td>f_2</td><td>f_3</td><td>$S=0.8\text{ mm}$</td><td>Y</td><td>12</td></tr><tr><td>f_3</td><td>$f_4=200\text{ Hz}$</td><td>$a_2=8\text{ g}_n$</td><td>Z</td><td>12</td></tr><tr><td colspan="3">返回至 $f_1=7\text{ Hz}$</td><td>总计</td><td>36</td></tr></table> <p>f_1, f_4——下限、上限频率； f_2, f_3——交越点频率($f_2\approx 17.62\text{ Hz}$, $f_3\approx 49.84\text{ Hz}$)； a_1, a_2——加速度幅度； S——位移幅度。</p> <p>注：振动参数是指位移或加速度的最大绝对数值，例如：位移量为 0.8 mm 对应的峰—峰值的位移量为 1.6 mm。</p> <p>每个方向进行 12 个循环，每个方向循环时间共计 3h 的振动。电池按照三个相互垂直的方向进行振动试验。</p> <p>Standard charge the cell, after which cell is firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes.</p> <p>This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.</p>	频率		振动参数	对数扫频循环时间 (7 Hz-200 Hz-7 Hz)	轴向	振动周期数	起始	至	$f_1=7\text{ Hz}$	f_2	$a_1=1\text{ g}_n$	15 min	X	12	f_2	f_3	$S=0.8\text{ mm}$	Y	12	f_3	$f_4=200\text{ Hz}$	$a_2=8\text{ g}_n$	Z	12	返回至 $f_1=7\text{ Hz}$			总计	36	不起火、不爆炸，不冒烟。 No Fire、No Explosion, No Smoking.
频率		振动参数	对数扫频循环时间 (7 Hz-200 Hz-7 Hz)	轴向					振动周期数																							
起始	至																															
$f_1=7\text{ Hz}$	f_2	$a_1=1\text{ g}_n$	15 min	X	12																											
f_2	f_3	$S=0.8\text{ mm}$		Y	12																											
f_3	$f_4=200\text{ Hz}$	$a_2=8\text{ g}_n$		Z	12																											
返回至 $f_1=7\text{ Hz}$				总计	36																											



9.安全性能 Safety Performance

序号 NO.	项目 Item	测试方法和条件 Test methods and condition	标准 Criteria
9.1	过充 Overcharge Test	<p>电池以 0.2C 放电至 2.8V，再用 3C 充电至 4.6V。当温度下降到比峰值低约 20%时，结束试验。</p> <p>Discharge the cell to 2.8V at 0.2C, then charge the cell to 4.6V at 3.0C until the temperature drops to 20% lower than the maximum value.</p>	<p>不起火、不爆炸。</p> <p>No Explosion、No Fire.</p>
9.2	短路 Short-circuit Test	<p>标准充电后，在 $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 的环境下使用总内阻 $80 \pm 20\text{m}\Omega$ 的导线短路正负极，当电池温度下降到比峰值低约 20%时，结束试验</p> <p>Standard charge the cell, after which short-circuit the cell by connecting positive and negative terminal with $80 \pm 20 \text{ m } \Omega$ wire under the environment of $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$, until the temperature drops to 20% lower than the maximum value.</p>	<p>不起火、不爆炸。</p> <p>No Explosion, No Fire.</p>
9.3	热冲击 Thermal Shock	<p>电池放置于热箱中，温度以 $(5 \pm 2^{\circ}\text{C})$ 的速率升温至 $(130 \pm 2^{\circ}\text{C})$ 并保温 30 分钟。</p> <p>Heat up cell in an oven with temperature ramp of $5^{\circ}\text{C} \pm 2^{\circ}\text{C}/\text{min}$, cutoff temperature of $130^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Maintain the temperature for 30 minutes.</p>	<p>不起火、不爆炸。</p> <p>No Explosion, No Fire.</p>
<p>备注：以上安全性能实验应在有保护措施的条件下进行。</p> <p>Note: Test of safe performance above must be with protective equipment.</p>			

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10. 包装图 Packing Drawing

			
电芯按吸塑槽位方向摆放，正面朝上；	吸塑叠放层数为12层，顶部加盖一层空吸塑；	使用透明胶纸将吸塑两侧缠绕固定好；	将缠好的电芯放入纸箱，要求电芯高度与纸箱高度一致，尾数箱电芯低于纸；箱高度的需塞入填充物，
			
电芯装好后，使用透明胶纸将纸箱封好；	将打包好的纸箱置于电子秤上称重，质量与工艺要求重量不符的需开箱复检；	在外箱上按标识卡要求填写该箱电芯实际的信息，贴于右侧面右上角距边5-15mm处；	将装箱的电芯叠放在卡板上，层数不超过5层；

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11. 警告及注意事项 Warning and cautions

为防止电池可能发生的泄露、发热、起火，请注意以下预防措施：

To prevent the possibility of the battery from leaking, heating, fire, please observe the following precautions:

- 电池外包装膜容易被镍片、尖针等尖锐部件损伤，禁止用尖锐部件损伤电池。
The soft aluminum packing foil is prone to be damaged by sharp edge parts such as MI-tabs and needs, do not wreck battery with any sharp edge parts.
- 严禁将电池浸入海水或水中。
Do not immerse the battery in fresh water or seawater.
- 禁止将电池在热高温源旁，如火、加热器等使用设备
Do not use and leave the battery near a heat source such as fire and heater.
- 禁止颠倒正负极使用电池
Do not reverse use the position and negative terminals.
- 严禁将电池直接接入电源插座
Do not connect the battery to an electrical outlet directly.
- 禁止用金属直接连接电池正负极短路，任何时候禁止短路电芯，它会使电芯受到严重损坏。
Do not short circuit the positive and negative terminal directly with metal objects such as wire, which is strictly prohibited under any circumstance, it may damage battery.
- 禁止将电池与金属，如发夹、项链等一起运输或储存。
Do not transport and store the battery together with metal objects such as necklaces, hairpins.
- 严禁敲击或抛掷，踩踏电池等。
Do not strike, throw or trample the battery.
- 禁止直接焊接电池或用钉子或其它利器刺穿电池
Do not directly solder the battery and pierce the battery with a nail or other sharp object.
- 禁止与不同型号的锂离子电池混合使用
Do not mix with others different lithium ion battery model.
- 禁止弯折顶封边，禁止打开或破坏折边，禁止弯折电芯折边底部。
Do not bend or fold sealing edge. Do not open or deform folding edge. Do not fillet the end of the folding edge.
- 禁止坠落、冲击、弯折电池
Do not drop, hit or bend the battery.
- 电池外壳设计和包装禁止损伤电池
Battery case design and pack must not injury the battery.
- 任何情况不得拆卸电池
Battery disassemble is prohibited.
- 更换电芯应由电芯供应商或设备供应商完成，用户不得自行更换。
Battery replacement shall be conducted only by either battery supplier or device supplier. Unauthorized replacement by user is prohibited.
- 禁止在强静电和强磁场的地方使用，否则易损坏电池安全保护装置，带来不安全的隐患。
Do not use the battery under strong electrostatic and magnetic field, otherwise, the safety devices may be damaged, causing potential risk of safety.
- 如果电池发生异味、发热、变色、变形或使用、储存、充电过程中出现任何异常现象，立即将电池从装置或充电器中移除并停用。

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If the battery diffuses odors, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, remove it from the device or battery charge and stop using immediately.

- 如果电池弄脏，使用前应用干布抹净，否则可能会导致接触不良功能失效。

In case the battery terminals are covered with dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.

- 禁止在高温下（直热的阳光下或很热的汽车中）使用或装置电池，否则可能会引起电池过热，起火或功能失效，寿命减短。

Do not use or leave the battery under high temperature conditions (for example, strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it may cause overheat, fire, performance degeneration or decreased cycle life.

- 废弃之电池应用绝缘纸包住电极，以防起火、爆炸。

Be aware discharged batteries may cause fire; wrap the terminals to insulate them.

12.其他事项 Others

- a)对于在超出文件规定以外的条件下使用电池而造成电池的任何意外事故，江西迪比科股份有限公司概不负责。

DBK will take no responsibility for any accident when the battery is used under other conditions than those described in this Document.

- b)如有必要，江西迪比科股份有限公司会以书面形式告知客户有关正确操作使用电池的改进措施。

DBK will inform, in a written form, the customer of improvement regarding proper use and handling of the battery, if it is deemed necessary.

- c)任何本说明书中未提及的事项，须经双方协商确定。

Any subject that this specification does not cover should be conferred between the customer and DBK.

-----END-----

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Global Packaging Refresh Quantitative Study



Consumer Insights
April 2018

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Background & Objectives

The Belkin Marketing team seeks to streamline and further elevate Belkin's packaging designs with a clearly defined logic and step-up strategy. This research was designed to meet the following objectives:

Research Objectives

- Understand how consumers differentiate between and shop for packages in store
- Understand the hierarchy of packaging elements and placement preferences for those elements
- Inform Belkin's packaging design moving forward to ensure cohesion across all product categories on a global level



Methodology

An online survey was conducted among N=2,800 smartphone owners in the US, the UK, France, Germany, Australia, Japan, and Korea in April 2018. Respondents were sourced through a nationally representative panel and those who completed the survey in its entirety received an incentive for their participation. The survey was kept blind so respondents did not know Belkin funded the research study.

Target Audience

- Decision maker of tech purchases
- 18 – 55 years old
- 50/50 gender split
- Smartphone owner

Total	N=2,800
US	400
UK	400
France	400
Germany	400
Australia	400
Japan	400
Korea	400



Executive Summary

Package Element Preferences

Aside from the value of the product, consumers find compatibility information and technical specifications to be the most important elements on a smartphone accessory product package. Brand reputation is also highly important as this implies quality and durability. Consumers slightly prefer that compatibility information is communicated through a list of device models.

Mobile Power Category Preferences

Across all mobile power categories, consumers expect to see the product on the front of the package, either through a window or a photo, and want to see detailed product descriptions and explanations of how the product works on the back of the package. On the front of the package they prefer plastic windows to photos as being able to see the product helps them perceive its quality and help to assure them they are buying the correct product.

Consumers prefer that charging speed on wireless charging pad packages be communicated through hours/minutes. On power bank packages, consumers want to see data on charging speed – namely, how quickly it will charge their device and how long the power bank itself will take to recharge.

Shopping Behaviors and Preferences

Globally, the majority of consumers research products before going to a store to shop, primarily comparing products online, and 6 in 10 consumers spend time browsing the shelf when in store. While 4 in 10 always look at the sides/back of product packages before making a purchase, an equal number only interact with eye-catching packages or those that they want to compare.

When comparing packages of interest, clear technical specifications, brand, and price are the most influential drivers of decision-making. In determining which product is more premium, consumers look for high quality product photos and a window so that they can see the actual product.

Brand Awareness and Perceptions

Apple and Samsung lead globally in both unaided and aided brand awareness. While Belkin's unaided awareness is low and on par with Nokia, it leads competitors like Amazon Basics in aided awareness.

Belkin's smartphone accessory brand block is seen as useful, basic and ordinary. There is room for improvement on perceptions of quality, reliability, and premiumness.



Recommendations

- 1 Design packages in a **clean** and **simple** format to clearly showcase the elements that are important to consumers: compatibility and technical specifications

- 2 Highlight **compatibility** information via a list of device models on the front of the package to reassure consumers a product will work with their device

- 3 Communicate **charging speed** through hours/minutes on wireless charging pad packages and highlight data on increased charging speed (e.g., “40% faster) on power bank packages

- 4 Add a **window** to product packages to help increase trust in the product and perceptions of quality

- 5 Increase marketing efforts (beyond packaging) to improve perceptions of **quality, reliability, and premium**



Packaging Overview

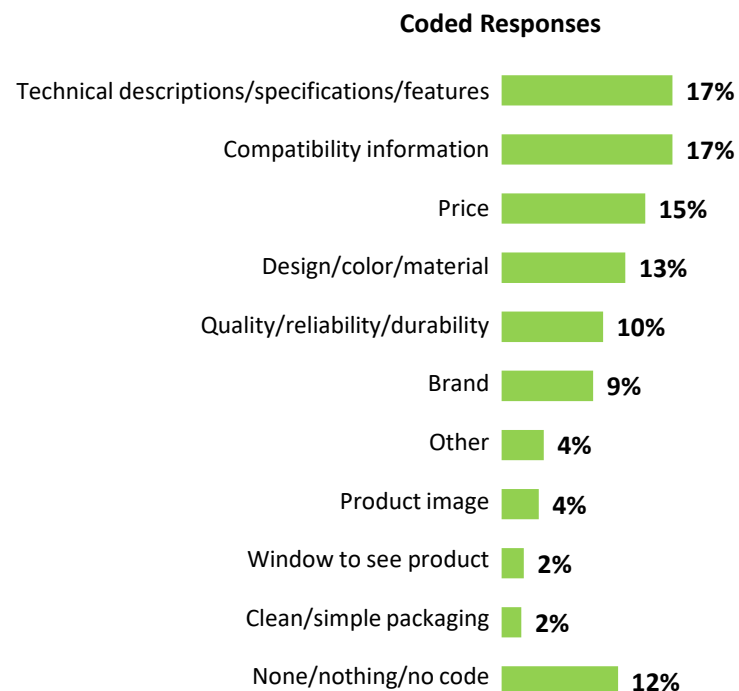




First Glance Package Elements – Open-Ended Feedback

When shopping in store for a smartphone accessory, consumers look first for technical specifications and compatibility information, followed by price and design.

Base: Total US Respondents (n=400)



*Q. When shopping for an smartphone accessory in a physical store, what is the **first thing** you look for on the product package? Why?*


















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Importance of Package Elements – High Importance

Global consumers find value and information on device compatibility and connector types to be the most important elements on a smartphone accessory package.

Base: Total Respondents
Extremely/Very Important

	Total (n=2,800)	 USA (n=400)	 UK (n=400)	 France (n=400)	 Germany (n=400)	 Australia (n=400)	 Japan (n=400)	 Korea (n=400)
Is a good value for the money	 83%	85%	80%	79%	86%	84%	83%	82%
Tells me what device(s) it is compatible with	 82%	86%	83%	82%	75%	90%	81%	74%
Tells me what connector types it uses	 73%	79%	72%	73%	71%	77%	74%	66%
Has text descriptions to tell me how the product works	 69%	70%	64%	76%	70%	70%	66%	67%
Has a plastic window so I can see the product	 65%	70%	63%	73%	59%	70%	62%	61%
Has a photo of the actual product	 62%	65%	61%	65%	55%	64%	60%	67%
Tells me the product comes with a warranty	 62%	59%	57%	59%	70%	66%	59%	64%
Has images to show more detail about the product	 59%	64%	59%	64%	50%	57%	56%	66%
Has photos/illustrations to show me how the product works	 59%	64%	57%	62%	53%	63%	59%	59%
Has icons to illustrate key product features	 56%	57%	55%	63%	56%	55%	52%	52%

Q. When looking at a smartphone accessory package at a physical store, how important or unimportant are each of the following to you?

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Most Important Package Elements

Aside from value, global consumers find device compatibility and brand reputation to be the most important elements of a smartphone accessory package.

Base: Rated 2+ Elements Extremely/Very Important

	Total (n=2,651)	USA (n=384)	UK (n=380)	France (n=370)	Germany (n=382)	Australia (n=384)	Japan (n=373)	Korea (n=378)
Is a good value for the money	40%	33%	36%	40%	54%	39%	33%	46%
Tells me what device(s) it is compatible with	15%	19%	18%	17%	9%	19%	20%	6%
Is made by a reputable brand	12%	18%	19%	3%	8%	17%	12%	9%
Has a plastic window so I can see the product	4%	4%	4%	7%	3%	5%	3%	3%
Has an appealing packaging design	4%	3%	2%	3%	2%	3%	4%	10%
Tells me the product comes with a warranty	4%	3%	4%	4%	4%	3%	3%	4%
Has an opening so I can touch the physical product	3%	2%	3%	2%	3%	1%	3%	4%
Tells me what connector types it uses	2%	2%	1%	3%	4%	2%	3%	1%
Has a photo of the actual product	2%	1%	2%	2%	2%	2%	2%	3%
Has an extra panel I can open containing more detailed information/images	2%	3%	1%	3%	2%	1%	2%	2%
Has data to support product features	2%	2%	1%	1%	1%	1%	6%	1%
Has icons to illustrate key product features	2%	2%	1%	2%	2%	1%	2%	1%
Has images to show more detail about the product	2%	0%	2%	2%	1%	1%	3%	3%

Note: Only elements with a global percentage of 1% or more are shown.

*Q. You said the following are important to you when looking at a smartphone accessory package in a physical store. Which is the **most important** to you?*

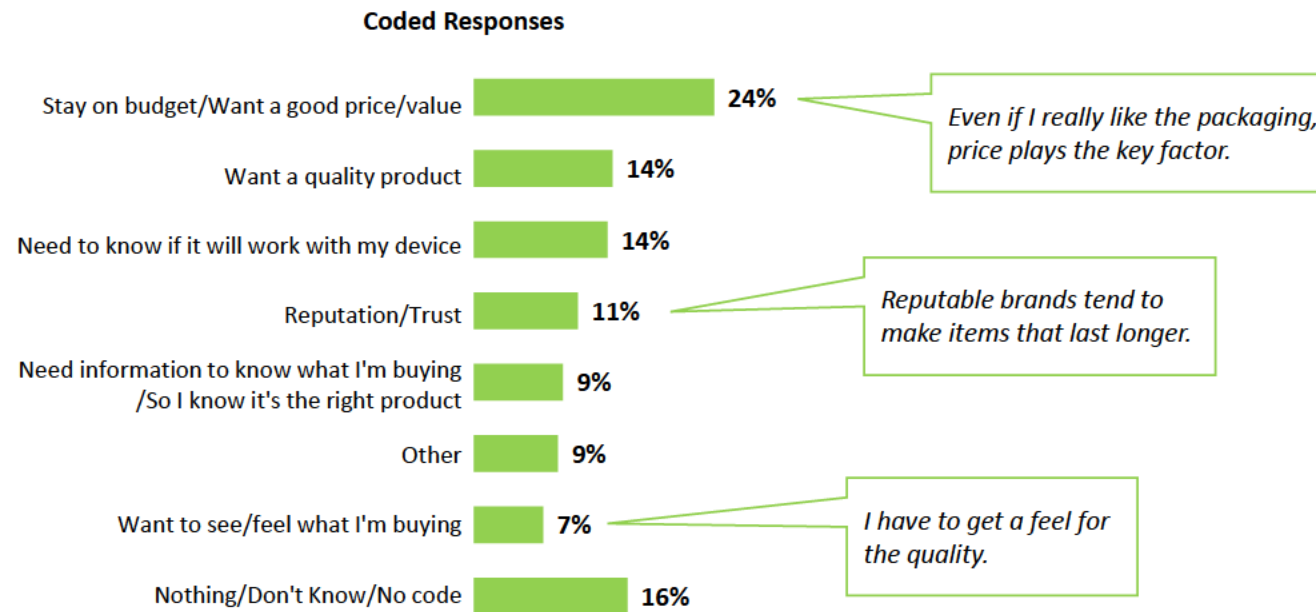
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Most Important Package Elements – Open-Ended Reasons for Selection

Along with the desire to get a perceived good value out of their purchase, consumers want a quality product that they are absolutely sure will work with their device.

Base: Total US Respondents (n=400)



Q. You said this element is most important to you when looking at a smartphone accessory package in a physical store. Why?











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Device Compatibility Preferences

About 4 in 10 global consumers prefer that compatibility be listed by specific device model, followed by device type. Compatibility listed by connector type is least preferred.

Base: Total Respondents

		 USA (n=400)	 UK (n=400)	 France (n=400)	 Germany (n=400)	 Australia (n=400)	 Japan (n=400)	 Korea (n=400)
Device model (e.g., iPhone 8, Galaxy S8, Pixel 2, etc.)	 42%	45%	42%	40%	38%	46%	38%	46%
Device type (e.g., Apple, Samsung, Google, etc.)	 35%	35%	33%	41%	36%	31%	31%	39%
Connector type (e.g., lightning, micro-USB, USB-C, etc.)	 23%	20%	25%	19%	27%	24%	31%	15%

Q. Now, thinking about device compatibility, which of the following gives you confirmation that a product will work with your device?










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Device Compatibility Preferences, Cont.

Among both those who prefer compatibility be shown through device type and those who prefer connector type, over half of consumers would also need to see a list of specific models. This preference is stronger in both groups in Australia, and stronger only among those who prefer device type in France.

Base: Prefers Compatibility Listed by Device Type

		 USA (n=140)	 UK (n=133)	 France (n=165)	 Germany (n=143)	 Australia (n=122)	 Japan (n=124)	 Korea (n=155)
I also need to see a list of models that includes my device	 56%	48%	56%	66%	55%	65%	48%	55%
Device type alone is enough	 44%	52%	44%	34%	45%	35%	52%	45%

Base: Prefers Compatibility Listed by Connector Type

Compatibility Listed by Connector Type		(n=641)	(n=79)	(n=100)	(n=76)	(n=106)	(n=95)	(n=124)	(n=61)
I also need to see a list of models that includes my device	<div><div></div></div> 52%	41%	52%	46%	50%	65%	55%	54%	
Connector type alone is enough	<div><div></div></div> 48%	59%	48%	54%	50%	35%	45%	46%	

Q. Is device type (e.g., Apple, Samsung, Google, etc.) alone enough to give you confirmation that a product will work with your device, or do you also need to see a list of device models (e.g., iPhone 8, Galaxy S8, Pixel 2, etc.)?

Q. Is connector type (e.g., lightning, micro-USB, USB-C, etc.) alone enough to give you confirmation that a product will work with your device, or do you also need to see a list of device models (e.g., iPhone 8, Galaxy S8, Pixel 2, etc.)?

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Importance of Package Elements – Lower Importance

Slightly more than half of global consumers find brand reputation and data to support product features to be important packaging elements. Brand reputation is particularly important to US and Australian consumers.

Base: Total Respondents
Extremely/Very Important

	Total (n=2,800)	 USA (n=400)	 UK (n=400)	 France (n=400)	 Germany (n=400)	 Australia (n=400)	 Japan (n=400)	 Korea (n=400)
Is made by a reputable brand	 55%	69%	60%	31%	42%	66%	57%	61%
Has data to support product features	 52%	58%	45%	49%	45%	48%	60%	59%
I am able to pick up/interact with the box	 50%	65%	55%	38%	37%	58%	34%	63%
Has an extra panel I can open containing more detailed information/images	 47%	52%	45%	49%	41%	42%	45%	60%
Has an opening so I can touch the physical product	 43%	48%	42%	41%	39%	38%	43%	54%
Has an appealing packaging design	 40%	41%	37%	41%	33%	34%	39%	54%
Is packaged in high quality materials	 40%	50%	41%	51%	28%	32%	27%	48%
Is recommended by the store associate	 34%	42%	36%	43%	33%	32%	26%	29%
Has award/endorsement badges	 33%	38%	31%	26%	37%	24%	32%	40%
Shows product specifications in multiple languages	 29%	37%	33%	36%	28%	22%	19%	28%
Has a QR code to find out more information about the product	 28%	34%	28%	30%	23%	21%	24%	35%

Q. When looking at a smartphone accessory package at a physical store, how important or unimportant are each of the following to you?




















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Least Important Package Elements

Among those package elements consumers find less important, having product specifications in multiple languages and having a QR code are the least useful elements. Consumers in the US, UK, and Australia find these elements less important than other global consumers.

Base: Rated 2+ Elements Not Very/Not at All Important

		 USA (n=227)	 UK (n=233)	 France (n=221)	 Germany (n=306)	 Australia (n=257)	 Japan (n=251)	 Korea (n=191)
Shows product specifications in multiple languages	 17%	35%	29%	10%	7%	30%	6%	7%
Has a QR code to find out more information about the product	 17%	19%	27%	12%	8%	27%	14%	18%
Has an appealing packaging design	 7%	9%	7%	5%	7%	8%	8%	8%
Is recommended by the store associate	 7%	7%	8%	6%	8%	2%	8%	8%
Is packaged in high quality materials	 7%	7%	7%	6%	5%	9%	8%	5%
Has award/endorsement badges	 6%	6%	6%	6%	6%	5%	8%	6%
Has an opening so I can touch the physical product	 6%	2%	4%	8%	7%	5%	6%	8%
Has an extra panel I can open containing more detailed information/images	 4%	0%	0%	6%	9%	1%	5%	5%
I am able to pick up/interact with the box	 4%	2%	2%	5%	5%	1%	7%	5%
Is made by a reputable brand	 3%	3%	2%	6%	4%	3%	2%	4%
Has data to support product features	 3%	2%	1%	4%	6%	2%	3%	1%
Has a photo of the actual product	 3%	2%	2%	3%	3%	1%	4%	5%

Note: Only elements with a global percentage of 2% or more are shown.

*Q. You said the following are important to you when looking at a smartphone accessory package in a physical store. Which is the **least important** to you?*

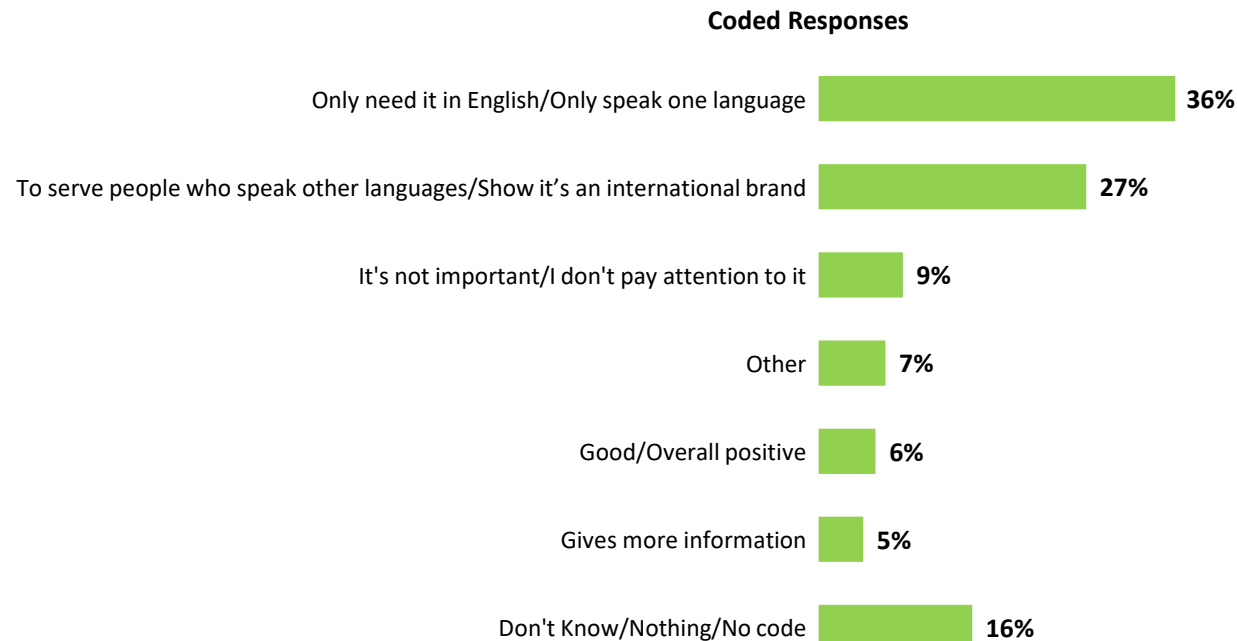
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Sentiment Around Multiple Languages on Package – Open Ended Reasons

Consumers are split on whether or not product specifications should be shown in multiple languages on a smartphone accessory package. While about one third think they should only be shown in the country's native language, about 3 in 10 think having multiple languages is inclusive of non-native speakers and showcases a brand's international status.

Base: Total US Respondents (n=400)



Q. You said it is important/unimportant that product specifications are shown in multiple languages on a package. Why?










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QR Code Scanning Behavior

Almost 6 in 10 global consumers who find QR codes to be important report having ever scanned one. While this number is greater in the US and Korea, with two-thirds of consumers report having scanned a QR code, it is highest in Japan with nearly 8 in 10 consumers having ever scanned a code.

Base: Rated QR Codes Extremely/Very Important

		 USA (n=135)	 UK (n=110)	 France (n=119)	 Germany (n=91)	 Australia (n=85)	 Japan (n=96)	 Korea (n=140)
Yes	 57%	67%	42%	36%	60%	47%	77%	69%
No	 43%	33%	58%	64%	40%	53%	23%	31%

Q. You said having a QR code to find out more information about the product is important to you. Have you ever scanned a QR code on a smartphone accessory package?

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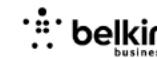
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Mobile Power Category Deep Dive





Package Element Placement Preferences – Wireless Charging Pads

When it comes to wireless charging pad packages, global consumers want to be able to see the product on the front of the package, preferring a plastic window over a photo or a physical opening. They prefer that detailed product descriptions and explanations of how it works be placed on the back of the package.

Base: Total Respondents (n=1,128)

	Front of Package	Back of Package	Side of Package	Inside an Extra Panel
A plastic window that shows the product	72%	13%	9%	6%
A photo of the actual product	65%	21%	8%	7%
An opening so I can touch the physical product	58%	14%	17%	11%
Information on device compatibility	46%	32%	16%	7%
Icons that illustrate key product features	44%	27%	18%	10%
Information on connector types	44%	32%	17%	7%
Information/data on how fast the product will charge my device	43%	30%	17%	10%
Detailed product images/illustrations	32%	39%	10%	19%
Lifestyle imagery to display a use case	29%	37%	16%	19%
Photos/illustrations to show me how the product works	28%	43%	11%	18%
A QR code to find out more information	20%	41%	28%	11%
A warranty claim	19%	41%	14%	26%
Comparison charts on speed of charging	18%	45%	24%	14%
Text descriptions to tell me how the product works	16%	50%	13%	20%
Detailed product descriptions	15%	53%	10%	22%
Detailed warranty information	14%	40%	13%	32%

Q. Thinking about wireless charging pad packages, please rank how important each of the following pieces of information is to you.











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Wireless Charging Speed Communication Preferences

Globally, 6 in 10 consumers prefer to see charging speed stated in hours/minutes on a wireless charging pad package. This preference is stronger among German consumers.

Base: Total Respondents

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Using hours/minutes (e.g., "+30 hours")	 60%	53%	58%	63%	72%	59%	59%	58%
Using percentages (e.g., "30% faster")	 26%	26%	23%	26%	21%	25%	26%	34%
Using multiples (e.g., "5X longer")	 13%	21%	18%	10%	6%	14%	15%	8%

Q. Thinking about wireless charging pad packages, how do you prefer to see charging speed communicated?

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Package Element Placement Preferences – Power Banks

When it comes to power bank packages, global consumers want to be able to see the product on the front of the package, preferring a plastic window over a photo or a physical opening. They prefer that detailed product descriptions and explanations of how it works be placed on the back of the package.

Base: Total Respondents (n=1,110)

	Front of Package	Back of Package	Side of Package	Inside an Extra Panel
A plastic window that shows the product	73%	12%	8%	7%
A photo of the actual product	65%	20%	8%	7%
An opening so I can touch the physical product	59%	13%	19%	9%
Information on device compatibility	46%	32%	14%	8%
Information/data on how fast the product will charge my device	43%	29%	18%	11%
Icons that illustrate key product features	40%	33%	18%	9%
Information on connector types	40%	33%	20%	7%
Detailed product images/illustrations	34%	37%	10%	20%
Lifestyle imagery to display a use case	30%	33%	15%	23%
Photos/illustrations to show me how the product works	26%	41%	11%	23%
Comparison charts on speed of charging	20%	42%	20%	18%
A QR code to find out more information	20%	41%	27%	12%
A warranty claim	19%	38%	13%	29%
Text descriptions to tell me how the product works	17%	49%	13%	20%
Detailed product descriptions	17%	53%	10%	21%
Detailed warranty information	13%	41%	14%	33%

Q. Thinking about power bank/portable power packages, please rank how important each of the following pieces of information is to you.












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Power Bank Data Preferences

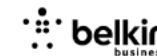
Globally, consumers find speed of charging information, both for their device and the power bank itself, to be more important than information on the number of hours it will add or number of time it will charge their device.

**Base: Total Respondents
Ranked 1 or 2**

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Shows me how quickly it will charge my device (e.g., "40% faster")	 58%	60%	53%	53%	61%	59%	63%	60%
Shows me how long it will take to fully recharge after using it to charge my device	 53%	52%	50%	56%	38%	59%	46%	70%
Shows me how many hours it will add to my device (e.g., "+30 hours")	 49%	53%	54%	52%	54%	48%	45%	37%
Shows me the number of times it will fully charge my device (e.g., "up to three times")	 39%	35%	41%	38%	45%	34%	45%	33%

Q. Thinking about power bank/portable power packages, please rank how important each of the following pieces of information is to you.

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Package Element Placement Preferences – Car Chargers

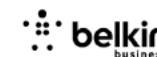
When it comes to car charger packages, global consumers want to be able to see the product on the front of the package, preferring a plastic window over a photo or a physical opening. They prefer that detailed product descriptions and explanations of how it works be placed on the back of the package.

Base: Total Respondents (n=1,120)

	Front of Package	Back of Package	Side of Package	Inside an Extra Panel
A plastic window that shows the product	75%	12%	7%	6%
A photo of the actual product	65%	20%	7%	7%
An opening so I can touch the physical product	57%	15%	19%	9%
Information on device compatibility	45%	33%	14%	8%
Icons that illustrate key product features	43%	28%	19%	10%
Information on connector types	43%	32%	18%	7%
Information/data on how fast the product will charge my device	39%	33%	17%	11%
Detailed product images/illustrations	32%	39%	11%	18%
Photos/illustrations to show me how the product works	28%	41%	11%	19%
Lifestyle imagery to display a use case	26%	37%	15%	21%
Comparison charts on speed of charging	20%	42%	21%	17%
A QR code to find out more information	18%	42%	28%	12%
Detailed product descriptions	16%	53%	11%	21%
Text descriptions to tell me how the product works	16%	52%	13%	20%
A warranty claim	16%	42%	14%	28%
Detailed warranty information	13%	41%	13%	33%

Q. Thinking about car charger packages, please rank how important each of the following pieces of information is to you.

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Package Element Placement Preferences – Wall Chargers

When it comes to wall charger packages, global consumers want to be able to see the product on the front of the package, preferring a plastic window over a photo or a physical opening. They prefer that detailed product descriptions and explanations of how it works be placed on the back of the package.

Base: Total Respondents (n=1,121)

	Front of Package	Back of Package	Side of Package	Inside an Extra Panel
A plastic window that shows the product	74%	12%	8%	5%
A photo of the actual product	68%	19%	7%	7%
An opening so I can touch the physical product	56%	16%	18%	10%
Information on device compatibility	46%	32%	14%	7%
Information on connector types	43%	30%	19%	8%
Information/data on how fast the product will charge my device	41%	29%	18%	11%
Icons that illustrate key product features	41%	32%	17%	9%
Detailed product images/illustrations	31%	40%	11%	19%
Lifestyle imagery to display a use case	26%	38%	14%	22%
Photos/illustrations to show me how the product works	23%	44%	12%	21%
A warranty claim	20%	38%	14%	29%
Comparison charts on speed of charging	19%	43%	21%	17%
A QR code to find out more information	18%	43%	27%	12%
Text descriptions to tell me how the product works	17%	52%	12%	19%
Detailed product descriptions	16%	55%	9%	20%
Detailed warranty information	11%	40%	13%	37%

Q. Thinking about wall charger packages, please rank how important each of the following pieces of information is to you.

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Package Element Placement Preferences – Charging Cables

When it comes to charging cable packages, global consumers want to be able to see the product on the front of the package, preferring a plastic window over a photo or a physical opening. They prefer that detailed product descriptions and explanations of how it works be placed on the back of the package.

Base: Total Respondents (n=1,121)

	Front of Package	Back of Package	Side of Package	Inside an Extra Panel
A plastic window that shows the product	76%	11%	7%	6%
A photo of the actual product	67%	18%	7%	8%
An opening so I can touch the physical product	60%	13%	18%	9%
Information on device compatibility	46%	33%	13%	8%
Icons that illustrate key product features	44%	28%	17%	10%
Information/data on how fast the product will charge my device	44%	31%	15%	11%
Information on connector types	42%	32%	17%	9%
Detailed product images/illustrations	35%	39%	10%	17%
Photos/illustrations to show me how the product works	30%	40%	12%	18%
Lifestyle imagery to display a use case	26%	36%	16%	21%
A QR code to find out more information	21%	41%	28%	10%
A warranty claim	19%	39%	13%	28%
Comparison charts on speed of charging	19%	43%	23%	16%
Text descriptions to tell me how the product works	18%	51%	13%	19%
Detailed product descriptions	17%	55%	10%	18%
Detailed warranty information	12%	40%	14%	34%

Q. Thinking about charging cable packages, please rank how important each of the following pieces of information is to you.

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Shopping Behaviors & Preferences
















Pre-Shop Research Habits

Globally, 8 in 10 consumers do research before going into a store to purchase smartphone accessories.

Base: Total Respondents

		 USA (n=400)	 UK (n=400)	 France (n=400)	 Germany (n=400)	 Australia (n=400)	 Japan (n=400)	 Korea (n=400)
	Total (n=2,800)							
Does Research (Net)*	 84%	84%	83%	82%	86%	75%	84%	92%
I do a lot of research	 31%	36%	23%	24%	42%	24%	26%	42%
I do a little research	 53%	49%	60%	58%	44%	51%	57%	50%
I don't do any research	 16%	16%	18%	18%	14%	25%	17%	9%

**Net: Aggregate of "I do a lot of research" and "I do a little research"*
















Q. How much research do you typically do before going to a physical store to purchase smartphone accessories?

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Types of Research Done

Global consumers primarily look up/compare products online and search for information via a search engine when researching smartphone accessories. While Korean consumers tend to compare products online more than other consumers, US consumers tend to rely more on reviews and German consumers more often talk to friends and family members.

		 USA (n=337)	 UK (n=330)	 France (n=328)	 Germany (n=344)	 Australia (n=301)	 Japan (n=334)	 Korea (n=366)
Look up/compare products online	 62%	55%	58%	55%	67%	55%	68%	74%
Search for products/information via a search engine	 55%	53%	49%	52%	56%	58%	59%	57%
Read online consumer reviews	 44%	56%	49%	34%	42%	27%	48%	48%
Talk to friends/family members	 42%	42%	39%	34%	52%	46%	32%	50%
Visit the brand's website for product details	 39%	46%	44%	34%	37%	42%	40%	31%
Read online consumer reviews on the manufacturer's website	 27%	38%	29%	18%	24%	32%	18%	28%
Read articles on tech websites/blogs	 17%	23%	15%	13%	18%	19%	18%	13%
Reach technology magazines or newspaper articles	 13%	16%	14%	11%	15%	10%	13%	11%

Q. What type(s) of research do you do before going to a store to purchase smartphone accessories?

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Pre-Shop Decision-Making Process

Globally, 6 in 10 consumers spend time browsing the shelf when shopping for a smartphone accessory. This tendency is even stronger among Japanese consumers, while fewer German consumers spend time browsing.

Base: Total Respondents

	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Spends time browsing the shelf in a physical store (Net)	60%	52%	53%	62%	54%	57%	77%	64%
I go in the store with an idea of what I want and confirm/change my decision based on the selection on shelf	43%	35%	36%	43%	45%	38%	57%	48%
I go in the store with an idea of what I want and confirm my decision by asking the store associate for a recommendation	22%	25%	24%	26%	16%	24%	12%	27%
I go in without an idea of what I want and decide after browsing the selection on the shelf	17%	17%	17%	19%	9%	19%	20%	16%
I do research before going into the store and know what I want to purchase, so I don't spend time browsing	13%	18%	17%	5%	25%	16%	11%	4%
I go in the store without an idea of what I want and rely entirely on store associates' recommendations	5%	6%	5%	6%	5%	4%	2%	5%

*Net: Aggregate of "I go into the store with an idea of what I want and confirm/change based on the selection on the shelf" and "I go in with an idea of what I want and decide after browsing the selection on the shelf"

Q. When planning to go to a physical store to buy a smartphone accessory, which of the following best describes you?












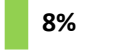
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Browsing Behavior

4 in 10 global consumers always looks at a smartphone accessory package before making a purchase, while an equal number only interact with packages if they are comparing two similar products or a package is particularly eye-catching.

Base: Browses Shelf Before Purchasing

								
	Total (n=1,672)	USA (n=208)	UK (n=211)	France (n=249)	Germany (n=216)	Australia (n=227)	Japan (n=305)	Korea (n=256)
I always look at the sides/back of the package before purchasing, even if I have done research beforehand	 40%	46%	42%	24%	43%	48%	43%	34%
I only pick up packages to look at the sides/back if there are two similar products I want to compare	 20%	19%	12%	27%	20%	15%	21%	23%
I pick up packages that catch my eye to look at the sides/back	 19%	18%	24%	18%	16%	18%	20%	21%
I don't spend much time looking, I just pick a style I like and purchase it	 13%	9%	14%	18%	8%	15%	13%	13%
I don't spend much time looking, I just pick one made by a brand I know/trust and purchase it	 8%	7%	7%	13%	11%	6%	3%	9%

Q. You said you decide based on the selection on the shelf when deciding what smartphone accessory to purchase. Which of the following best describes how you make your decision?

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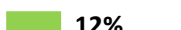
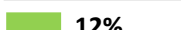
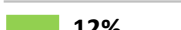
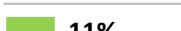

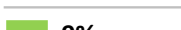


BELKIN_000188



Package Comparison Points

When comparing two or more similar smartphone accessories in store, consumers primarily use clearly listed technical specifications, brand, and price to decide which to purchase.

Base: Total Respondents

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
The one that most clearly states the product's technical specifications	 38%	36%	34%	36%	40%	41%	39%	42%
The brand I know/trust	 34%	36%	40%	31%	35%	35%	28%	32%
Whichever is cheaper/on sale	 34%	30%	34%	29%	33%	40%	35%	35%
Whichever has better online reviews	 24%	24%	23%	16%	22%	15%	29%	37%
The one that most clearly describes how to use the product through text	 19%	15%	19%	26%	20%	14%	22%	16%
Whatever the store associate recommends	 12%	9%	11%	18%	12%	9%	13%	15%
Whichever package has the most appealing aesthetics	 12%	12%	11%	9%	9%	10%	15%	20%
The one that most clearly shows how to use the product through photos	 12%	13%	11%	10%	12%	11%	13%	14%
The one that most clearly shows how to use the product through drawings	 11%	12%	10%	13%	11%	8%	10%	13%
The product that comes in a more premium-looking package	 10%	8%	10%	12%	7%	6%	9%	17%
The one that has award/endorsement badges on the package	 9%	10%	10%	7%	11%	6%	11%	10%
The one in the smaller package	 4%	6%	4%	4%	5%	1%	3%	3%
I buy the one in the larger package	 3%	6%	4%	3%	3%	3%	2%	5%

Q. When comparing two or more similar smartphone accessories products in store, which of the following factors do you use to choose which you will purchase?

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BELKIN_000189



Most Influential Comparison Point

Clear technical specifications, followed closely by price and brand, is the most influential factor consumers use to decide between two similar products in store.

Base: Total Respondents

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
The one that most clearly states the product's technical specifications	 24%	25%	18%	24%	25%	27%	23%	27%
Whichever is cheaper/on sale	 20%	16%	19%	17%	22%	28%	21%	19%
The brand I know/trust	 17%	19%	25%	17%	18%	18%	11%	12%
Whichever has better online reviews	 11%	13%	9%	6%	10%	8%	16%	14%
I buy whatever the store associate recommends	 6%	3%	6%	9%	3%	5%	7%	6%
The one that most clearly describes how to use the product through text	 6%	5%	6%	8%	7%	4%	6%	4%
Whichever package has the most appealing aesthetics	 4%	3%	5%	3%	2%	3%	6%	6%
The one that most clearly shows how to use the product through photos	 3%	4%	3%	4%	3%	3%	2%	3%
The product that comes in a more premium-looking package	 3%	4%	2%	5%	2%	1%	2%	5%
The one that most clearly shows how to use the product through drawings	 3%	2%	3%	4%	3%	2%	2%	3%
The one that has award/endorsement badges on the package	 2%	2%	2%	3%	2%	1%	4%	1%
The one in the smaller package	 1%	2%	1%	2%	2%	0%	1%	1%
The one in the larger package	 1%	2%	1%	1%	1%	0%	0%	1%

Q. Which factor is most influential when deciding between two or more similar smartphone accessories products to purchase?












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Technical Specification Preferences

Among those who use technical specifications to decide between two similar products, nearly two-thirds of consumers prefer that these specifications are displayed as simple icons with a little bit of text.

Base: Buys Product with Clearest Technical Specifications

								
	Total (n=674)	USA (n=101)	UK (n=70)	France (n=97)	Germany (n=100)	Australia (n=107)	Japan (n=92)	Korea (n=107)
Simple images/icons with a little bit of text	 65%	55%	63%	70%	72%	67%	62%	65%
Simple images/icons with a lot of text	 33%	47%	34%	25%	24%	34%	38%	32%
No images/icons, just text	 5%	4%	6%	7%	8%	3%	5%	5%
Simple images/icons with no text	 4%	7%	4%	2%	4%	5%	4%	3%

Q. You said you buy the product that most clearly states the product's technical specifications (e.g. compatibility, charging speed, etc.). How do you prefer that these specifications are shown?

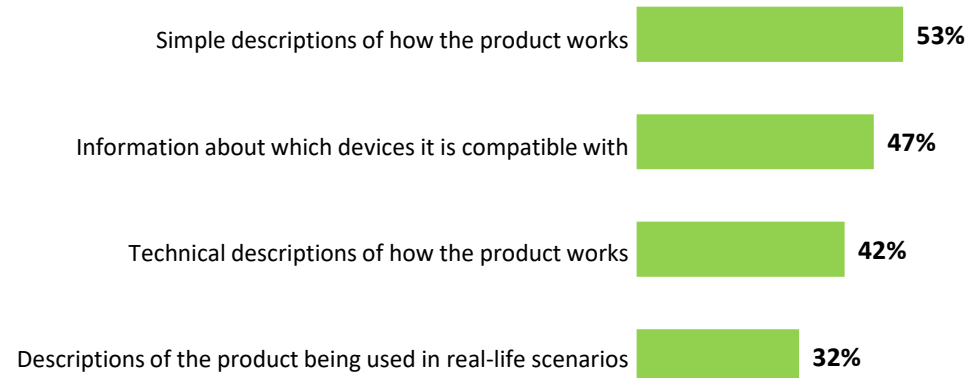
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Product Description Preferences

Among those who use product descriptions to decide between two similar products, consumers find simple text descriptions of how the product works and information about device compatibility to be the most important pieces of information.

Base: Buys Product with Best Descriptions (n=154)



Note: Insufficient base to read out by country.

Q. You said you buy the product that most clearly describes how to use the product. What types of descriptions best help you understand how to use the product?

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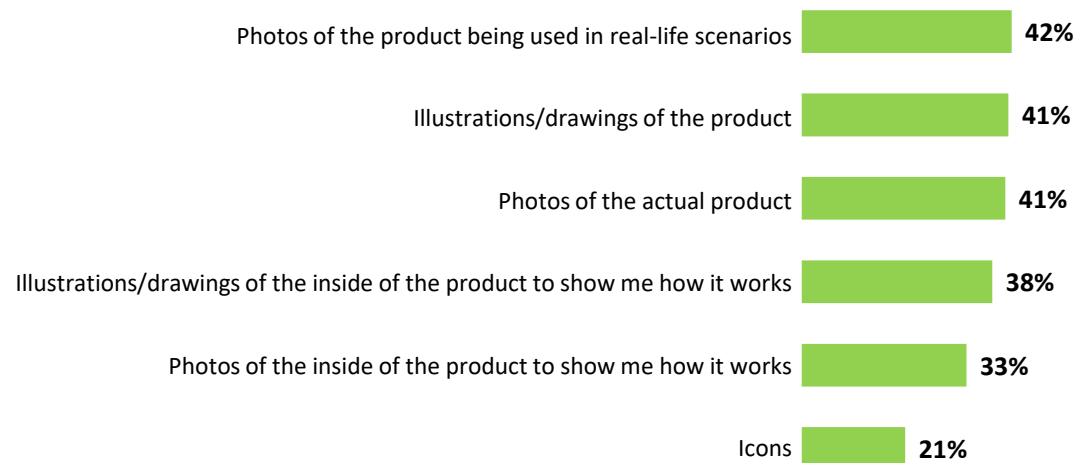
BELKIN_000192



Product Image Preferences

Among those who use product images to decide between two similar products, consumers find lifestyle imagery, illustrations, and product photos to be equally useful, followed closely by illustrations of the inside of the product.

Base: Buys Product with Best Images (n=155)



Note: Insufficient base to read out by country.

Q. You said you buy the product that most clearly illustrates how to use the product. What types of illustrations/images best help you understand how to use the product?

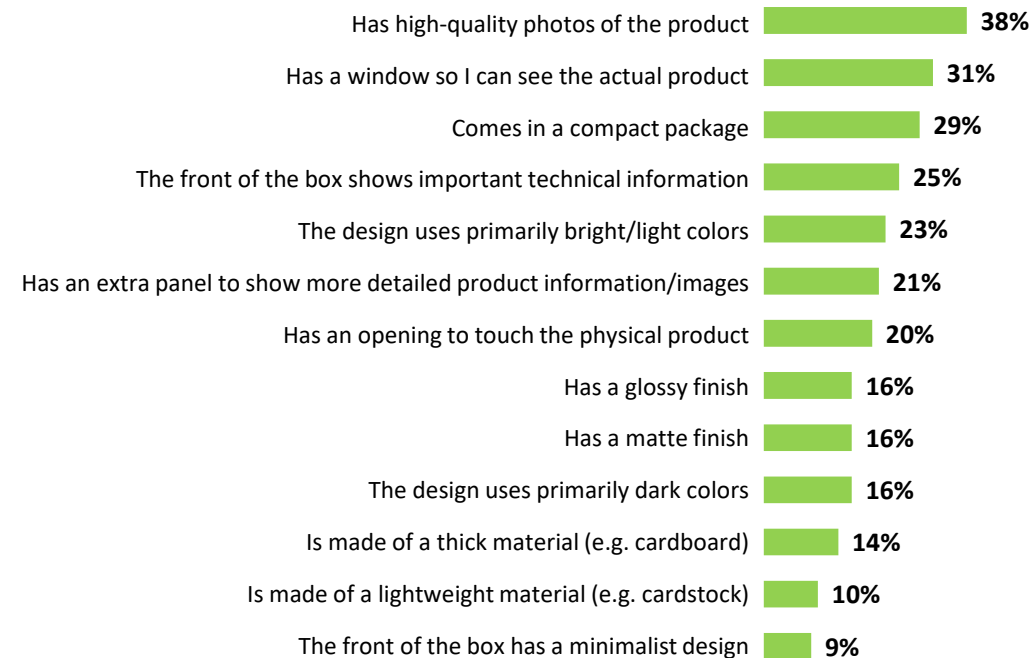
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Perceptions of Premium Packaging

Globally, high-quality product photos, a window that shows the actual product, and compact packages indicate to consumers that a package is premium.

Base: Buys Most Premium-Looking Product (n=80)



Note: Insufficient base to read out by country.

Q. You said you buy the product that comes in a more premium-looking package. In your opinion, what makes a package look/feel premium?








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Perceptions of Premium Packaging – Within Brand

When comparing two or more similar products made by the same brand, global consumers perceive that more premium products have a window that shows the actual product, an extra panel with more detailed information/images, and high-quality product photos.

Base: Total Respondents

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Has a window so I can see the actual product	41%	43%	40%	42%	46%	49%	37%	30%
Has an extra panel to show more detailed product information/images	28%	29%	25%	20%	30%	29%	32%	30%
Has high-quality photos of the product	27%	32%	29%	27%	27%	25%	24%	24%
Has a compact size/design	21%	16%	24%	14%	19%	17%	24%	34%
Has an opening to touch the physical product	19%	19%	20%	14%	21%	17%	20%	21%
Has a higher price	16%	17%	22%	6%	22%	18%	17%	8%
Has a special name (e.g., “Power Cord” vs. “Power Cord Plus”)	12%	12%	12%	17%	12%	11%	11%	7%
Has a glossy finish	11%	12%	17%	6%	9%	9%	11%	14%
Has a matte finish	11%	11%	13%	7%	10%	10%	10%	13%
The design uses primarily bright/light colors	10%	12%	11%	6%	11%	5%	10%	16%
The front of the box has a minimalist design	9%	8%	10%	6%	10%	8%	7%	18%
Is made of a lightweight material (e.g. cardstock)	9%	8%	9%	7%	8%	9%	12%	14%
Is made of a thick material (e.g. cardboard)	9%	13%	9%	8%	10%	8%	3%	11%
The design uses primarily dark colors	7%	10%	9%	5%	7%	6%	7%	9%

Q. When comparing two or more similar smartphone accessories made by the same brand in store, what about the package helps you to determine which is more premium?

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Brand Awareness & Perceptions

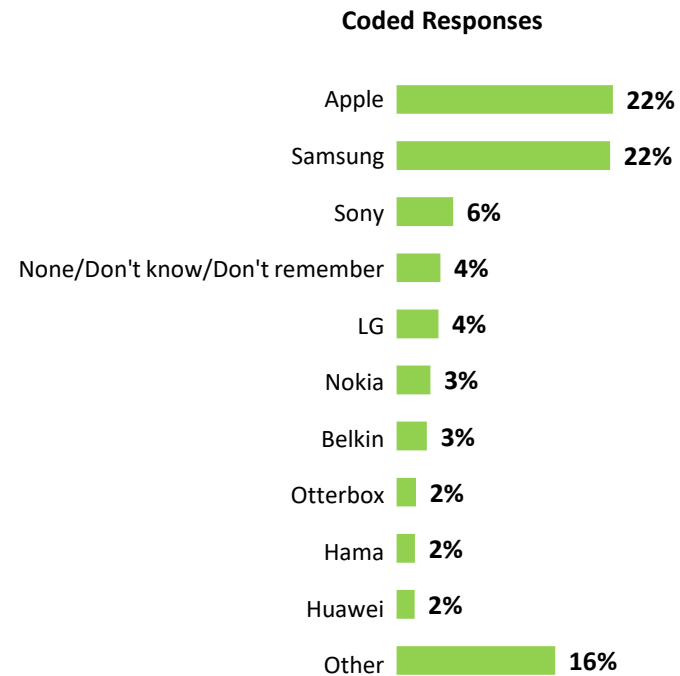




Unaided Brand Awareness

Globally, Apple and Samsung are the most top-of-mind smartphone accessory brands. Belkin's unaided awareness is low at 3%, on par with Nokia.

Base: Total Respondents (n=2,800)



Q. Thinking about brands of smartphone accessories, what brands come to mind?




















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Aided Brand Awareness

Globally, Apple, Samsung, Sony, and Google dominate brand awareness in the smartphone accessories space. Belkin leads Amazon Basics, with over half of global consumers aware of the brand. Awareness of Belkin is much higher in the US, UK, and Australia than in other countries, and is particularly low in Japan.

Base: Total Respondents

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Apple	 96%	99%	97%	93%	92%	99%	97%	98%
Samsung	 95%	98%	97%	96%	95%	98%	81%	97%
Sony	 94%	96%	97%	89%	92%	93%	96%	95%
Google	 91%	96%	95%	78%	89%	92%	92%	93%
Belkin	 56%	79%	70%	47%	42%	75%	25%	54%
Amazon Basics	 51%	68%	56%	40%	45%	31%	52%	63%
Softbank	 44%	38%	33%	25%	30%	21%	95%	64%
Xiaomi	 35%	34%	36%	32%	27%	23%	24%	73%
Anker	 33%	43%	39%	22%	27%	20%	40%	42%
iHome	 31%	69%	28%	24%	23%	16%	23%	38%
Juice	 30%	44%	45%	18%	20%	25%	22%	38%
Nomad	 30%	36%	27%	42%	17%	19%	24%	43%

Note: See appendix for remaining brands.

Q. Please tell us your familiarity with each of the following brands of smartphone accessories.













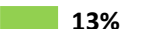
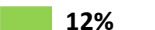

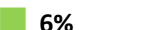
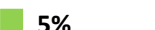

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Fast-Charging Technology Awareness

Globally, the most well-known fast-charging technologies are Samsung Adaptive Fast Charge and Apple Fast Charging, likely due to the inclusion of the brand name.

Base: Buys Product with Best Descriptions

								
	Total (n=2,340)	USA (n=337)	UK (n=330)	France (n=328)	Germany (n=344)	Australia (n=301)	Japan (n=334)	Korea (n=366)
Samsung Adaptive Fast Charge	 34%	39%	30%	33%	36%	27%	13%	63%
Apple Fast Charging	 32%	34%	37%	23%	30%	30%	29%	42%
Fast Charging	 22%	39%	34%	9%	16%	32%	7%	15%
Quick Charge	 21%	27%	25%	18%	15%	16%	23%	21%
Huawei SuperCharge	 15%	11%	16%	13%	22%	9%	13%	23%
Motorola TurboPower	 13%	17%	12%	7%	14%	8%	8%	25%
Power Delivery	 12%	14%	13%	11%	12%	7%	10%	13%
Qi	 9%	9%	12%	7%	8%	6%	17%	7%
Mophie Charge Force	 6%	14%	7%	3%	3%	2%	5%	7%
One Plus Dash Charge	 5%	7%	8%	4%	5%	2%	3%	7%
None of these	 36%	24%	32%	45%	41%	41%	50%	21%

Q. Before today, which of the following have you heard of?

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Brand Block Evaluation – Top 10 Attributes

Global consumers feel that Belkin's smartphone accessories brand block looks useful, basic, and ordinary.

Base: Total Respondents



								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Useful	<div><div></div></div> 37%	38%	40%	38%	43%	39%	27%	32%
Basic	<div><div></div></div> 32%	31%	27%	31%	29%	26%	34%	46%
Ordinary	<div><div></div></div> 30%	23%	22%	27%	39%	18%	42%	40%
Good value	<div><div></div></div> 24%	30%	29%	34%	30%	27%	7%	13%
Reliable	<div><div></div></div> 24%	26%	28%	23%	25%	32%	14%	21%
High quality	<div><div></div></div> 22%	30%	27%	16%	22%	25%	19%	14%
Trendy	<div><div></div></div> 15%	18%	15%	22%	21%	15%	10%	9%
Cool	<div><div></div></div> 15%	22%	17%	17%	12%	15%	14%	9%
Premium	<div><div></div></div> 14%	21%	19%	11%	12%	17%	9%	13%
Innovative	<div><div></div></div> 13%	22%	17%	11%	15%	15%	7%	7%

Note: See appendix for remaining attribute ratings.

Q. Looking at the family of products shown in the image below, which words would you use to describe the image?

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Demographics





Audience Demographics

	Total (n=2,340)	USA (n=337)	UK (n=330)	France (n=328)	Germany (n=344)	Australia (n=301)	Japan (n=334)	Korea (n=366)
Age								
18-24	9%	10%	11%	8%	19%	8%	6%	4%
25-34	27%	40%	26%	24%	21%	27%	28%	20%
35-44	32%	27%	31%	33%	25%	32%	32%	44%
45-54	32%	24%	33%	35%	35%	34%	35%	32%
Avg. Age	38	36	38	39	37	39	39	40
Gender								
Male	49%	50%	48%	50%	49%	45%	52%	51%
Female	51%	50%	52%	50%	51%	56%	49%	50%
Technology Profile								
Innovator	16%	30%	18%	15%	13%	10%	9%	17%
Early adopter	16%	15%	19%	15%	14%	14%	12%	22%
Early majority	49%	42%	47%	50%	49%	54%	60%	45%
Late majority	15%	12%	15%	13%	19%	18%	13%	12%
Laggard	4%	2%	1%	7%	5%	4%	7%	4%
Smartphone Type								
iPhone	35%	37%	43%	24%	29%	46%	49%	21%
Android	63%	63%	55%	74%	69%	53%	51%	79%
Other	1%	0%	3%	3%	3%	1%	0%	0%



Audience Demographics

	Total (n=2,340)	USA (n=337)	UK (n=330)	France (n=328)	Germany (n=344)	Australia (n=301)	Japan (n=334)	Korea (n=366)
Marital Status								
Single	34%	29%	34%	33%	40%	33%	39%	30%
Married	46%	51%	40%	37%	30%	41%	54%	66%
With significant other	13%	10%	19%	23%	20%	17%	1%	2%
Separated	1%	2%	1%	1%	2%	4%	0%	0%
Divorced	6%	8%	5%	5%	8%	5%	6%	2%
Widowed	1%	1%	1%	0%	1%	1%	1%	1%
Household Size								
1	17%	13%	15%	22%	28%	14%	15%	15%
2	24%	26%	26%	24%	29%	27%	20%	16%
3	26%	25%	24%	22%	21%	24%	30%	34%
4	23%	23%	25%	24%	16%	21%	23%	27%
5 or more	10%	13%	9%	9%	6%	14%	12%	9%
Parent or Guardian of Minor								
Yes	55%	61%	58%	65%	38%	55%	47%	61%
No	44%	39%	42%	33%	61%	44%	52%	39%

* Ethnicity only asked in United States.



Audience Demographics

	Total (n=2,340)	USA (n=337)	UK (n=330)	France (n=328)	Germany (n=344)	Australia (n=301)	Japan (n=334)	Korea (n=366)
Education								
Some high school	7%	2%	6%	6%	23%	10%	2%	0%
High school graduate	23%	22%	19%	26%	23%	24%	36%	10%
Some college	13%	20%	25%	15%	3%	20%	5%	3%
Associate's degree	10%	9%	6%	3%	29%	8%	6%	7%
Bachelor's degree	31%	29%	28%	21%	9%	28%	38%	66%
Master's degree	11%	13%	10%	18%	10%	9%	8%	11%
Doctoral degree	2%	1%	2%	3%	2%	1%	1%	2%
Professional degree	3%	5%	5%	7%	1%	1%	4%	2%
Employment Status								
Employed full-time	57%	54%	55%	70%	49%	46%	58%	69%
Employed part-time	13%	14%	16%	7%	19%	19%	13%	6%
Self-employed	7%	7%	7%	4%	5%	7%	10%	10%
Unemployed	6%	9%	8%	9%	8%	6%	3%	4%
Stay-at-home parent	9%	11%	9%	5%	3%	12%	13%	8%
Student	6%	4%	6%	5%	12%	6%	5%	3%
Retired	2%	2%	1%	0%	5%	4%	0%	0%



Audience Demographics

	USA (n=400)
Ethnicity	
Less than \$15,000	9%
\$15,000 - \$24,999	11%
\$25,000 - \$34,999	11%
\$35,000 - \$49,999	17%
\$50,000 - \$74,999	17%
\$75,000 - \$99,999	17%
\$100,000 - \$149,999	12%
\$150,000 or more	7%
Household Income	
Caucasian	57%
Latino	2%
African American	1%
Pacific Islander	2%
Native/Alaskan American	0%
Asian American	7%
Mixed ethnicity	4%
Other	28%



Appendix
























Aided Brand Awareness, Cont.

Globally, Belkin has higher brand awareness than brands such as Vivitar, Just Wireless, and Blackweb.

Base: Total Respondents

								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Belkin	 56%	79%	70%	47%	42%	75%	25%	54%
Vivitar	 27%	53%	36%	21%	15%	16%	18%	34%
Just Wireless	 27%	41%	29%	23%	24%	19%	20%	36%
Blackweb	 25%	37%	27%	21%	17%	17%	21%	39%
myCharge	 25%	38%	25%	21%	21%	15%	19%	35%
Mophie	 25%	43%	26%	16%	15%	15%	19%	38%
Aukey	 24%	31%	24%	20%	19%	13%	23%	35%
ZAGG	 23%	40%	24%	15%	17%	12%	19%	35%
Muvit	 22%	29%	22%	25%	15%	13%	19%	34%
Tzumi Electronics	 21%	33%	24%	15%	15%	12%	19%	34%
Native Union	 21%	26%	21%	18%	16%	11%	17%	36%
ESI	 20%	28%	22%	15%	15%	10%	18%	34%

Note: Only elements with a global percentage of 1% or more are shown.

*Q. You said the following are important to you when looking at a smartphone accessory package in a physical store. Which is the **most important** to you?*

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Brand Block Evaluation – Additional Attributes

Belkin's family of smartphone accessory products is not strongly associated with negative attributes such as being outdated or low quality, though there is room for improvement on being seen as unique.

Base: Total Respondents



								
	Total (n=2,800)	USA (n=400)	UK (n=400)	France (n=400)	Germany (n=400)	Australia (n=400)	Japan (n=400)	Korea (n=400)
Unimaginative	 10%	12%	11%	5%	9%	10%	16%	7%
Unique	 8%	18%	11%	3%	6%	8%	5%	7%
Boring	 8%	11%	9%	2%	8%	11%	5%	8%
Fun	 7%	14%	9%	4%	1%	6%	9%	5%
Dated	 6%	4%	5%	1%	3%	4%	22%	4%
Cheap	 6%	7%	8%	3%	4%	5%	7%	7%
Confusing	 5%	5%	7%	3%	4%	6%	5%	7%
Low quality	 3%	5%	5%	2%	2%	4%	2%	2%
Outdated	 2%	2%	3%	2%	2%	3%	1%	5%

Q. Looking at the family of products shown in the image below, which words would you use to describe the image?

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Thank you!





Project Objective	
Differentiation	✓
Neutralization	
First to Market	
Cost Leadership	

Project WORM

PGMXXXXX – BATTERY PACKS

Product Manager: Carlo Morrongiello

Product Dev. Manager:

Release Notes

Release	Date	Author	Notes
1.0	11/21/2016	Edward L.	Initial Draft.

SUMMARY

Description

Instructions: Write a short paragraph that describes what this product is. This statement should be derived from and supported by the PVP document.

Objective:

Expand our portable power accessory offering and leverage our battery pack capabilities. Continue to grow and gain market share in portable charging market by growing and elaborating on fast charging, multi-device, portability and safety story.

Target Market:

Smartphone / Tablet Users, BT Headphones / BT Speakers, Action Cameras /
Retailers: Walmart, Target, Media Markt, Dixon, JB Hifi, Belkin.com

Key Product Features:

Project Worm 1		Project Worm 2		Project Worm 3	
Capacity	4000mAh	Capacity	8000mAh	Capacity	12000mAh
Battery Type	Polymer	Battery Type	Polymer	Battery Type	Polymer
Output Port	1 USB-A	Output Port	2 USB-A	Output Port	2 USB-A
Output Amps	2.4A	Output Amps	2.4A (shared)	Output Amps	3.4A (shared)*
Input Port	m-USB	Input Port	m-USB	Input Port	m-USB
Input Amps	2.4A*	Input Amps	2.4A*	Input Amps	2.4A*
Cable	6" m-USB	Cable	6" m-USB	Cable	6" m-USB
LED	4 Lights	LED	4 Lights	LED	4 Lights
Housing	Plastic-PC	Housing	Plastic-PC	Housing	Plastic-PC
MFI capable				* Option to go 2.4A + 1.0A for MFI	

Product Life: 2-3 years

Warranty: 2 year limited warranty. CEW.

Estimated Annual Forecast: 1.25million (includes all three models)

USE CASE & ACCEPTANCE CRITERIA

USE CASE #1, On-The-Go Mobile User

Samantha takes public transportation to get to and from work but also to other events. When she's commuting she uses her smartphone to listen to music and play games. After a day's use for emails, calls and social media her phone is running out of juice. No outlets on buses and trains prevents her from charging her phone. This is the perfect situation for having a battery pack.

USE CASE #2, Multi-Device Compatibility

Chris is a vlogger and an early technology adopter who recently bought the Samsung S7 that has USB-C. Chris also owns an older tablet that uses m-USB and a GoPro Hero 3 which uses mini USB. He cannot be out of power for the ideal interview. In order for Chris to be prepared he would need a battery pack with multiple ports with different connectors.

USE CASE #3, Heavy Mobile User

Luke is a Sales Rep and is constantly traveling. He travels with his laptop, tablet and smartphone. He also has his Bluetooth headphones to listen to on the flight. He forgot to charge some of his devices and will not be prepared to go straight to work with the lack of USB/outlets on planes to provide the high current he would need. This is the ideal time for a high capacity battery to charge all devices.

USE CASE #4, At Home

Stephanie is relaxing over the weekend at her apartment but she forgot to charge her iPhone overnight. She's communicating with family about planning a surprise party. She needs to charge her iPhone to keep the conversation going but doesn't want to be tied to a wall socket because she needs to research on her computer as well. Outlets are not close enough so having a battery pack to charge her phone is ideal in this situation.

ACCEPTANCE CRITERIA**Fast Charging, Multi-Device**

- Optimal charge-out for devices that require higher speeds of charging
- Optimal charge-in for battery packs that allow for faster and shorter time of charging
- Plug up to 2 devices at the same time to the battery
- Charge other devices such as BT speakers, headphones, action cameras and others

Portability

- Thinner battery packs allow for easier transportation when on-the-go
- Compact design enables consumer to easily place into
- Materials to withstand everyday travel such as scratches, nicks, and drops
- Prevent wear and tear look with housing material on battery pack when transporting in bags with other devices

Safety & Quality

- Conduct electrical testing to batteries to ensure protection when charging devices (circuit, current, voltage, discharge)
- Efficient battery cells that provide maximum output of power while also being safe during use
- Battery shuts off when electrical surges or if dropping occurs before, during or after charging devices

WORM 1

- Introducing a battery pack that provides 2 charging cycles for a smartphone. Multi-port enables for simultaneous at fast charging speeds.
- The consumer who only needs to charge once through-out the day to top off the mobile device to keep them going into the night.
- The consumer who uses their smartphone at home while watching TV who needs a compact solution to carry around the house to listen to music while completing tasks.

WORM 2

- Provide a 8,000 mAh battery that can quickly charge mobile devices but also be portable enough to place in a pocket or bag when on-the-go.
- The consumer who needs to utilize their smartphone for work and personal usage but are quickly depleting the battery due to data usage and App usage.
- The always on-the-go consumer who is unable to find an outlet available but needs to charge their mobile device.

WORM 3

- Provide a 12,000 mAh battery for the consumer who travels with multiple devices. Multi-port enables the consumer to charge 2 devices at once. Fast charging output saves time.
- A user who charges 2-3 times a day because the mobile devices are being used to record interviews which uses high quality video and depletes the battery.
- The consumer who travels and needs to keep their headphones or tablet charged without worrying about how many wall plugs are needed for the trip.

Features and Requirements

Instructions: What features are required for this product? These requirements should be derived from and supported by the PVP document. This section is completed by Product Management with cross functional inputs from the scoping phase. Note that detailed specifications will be defined separately in the Product Technical Specification document by Functional Leaders. The information provided in this Product Requirements document must provide enough detail to begin the construction of the Product Technical Specification documentation.

Base Requirements for ALL Product Variations:

Instructions: What features are required for all variations of this product? Remember to leverage any common platforms developed to date by Belkin (ie. common OS, Network, UI, Cloud, etc...) To add rows in the tables, position the cursor in the table, go to the table menu, then select Insert > Rows Above (or Rows Below).

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
1.01	Design		All
1.02	Design	Colors to follow Belkin CMF standard. Rose gold, silver and black.	All
1.03	Design	LED color. Belkin green. What is the wavelength? And brightness level reference. TBD.	All
1.04	Design	Belkin logo position. Painted or embossed? TBD.	All
1.05	Function	4 LED indicator displays the battery capacity. A push-button will turn-on the 4 LED indicator and start device charging (when in sleep mode).	All
1.06	Function	Auto-start. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.	All
1.07	Function	Auto-sleep. If no activity is detected on the USB-A port (less than XXX mA), the battery pack will go into sleep-mode. The USB ports will turn off.	All
1.08	Function	Output when connected to the charging input.	All
1.09	Function	MFI capable. At least one model in the product line, ideally the most affordable, needs to be MFI capable.	All
1.10	Engineering	Micro-USB cable must be Charge/Sync (4-wire conductor). Micro-USB cable to be in black color with Belkin logo on the molded ends. No markings on the cable section. .	All
1.11	Engineering	Output D+/D- resistors. Need to get the details.	All

1.12	Engineering	Input charging power (rated vs expected)	All
1.13	HWQA	Old devices. 3 years old. Should not be considered a priority.	All
1.14	Reliability	Battery Packs must meet and comply with all reliability requirements for all regions (Reference Rel. Test Plan)	All
1.15	Sustainability	Product materials must meet and comply with all sustainability requirements for all regions (Reference Sustainability test plan)	All
1.16	Regulatory Compliance	Battery Packs must meet and comply with all regulatory compliance requirements for all regions (Reference RC Test Plan)	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Optional Requirements for ALL Product Variations:

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
2.01	Engineering	Efficiency. TBD.	All
2.02	Engineering	MFI for all battery pack models. Shared ports are not allowed and will be a problem on dual port models. An option for fixed ports (silkscreen and resistor settings) should be provided.	All
2.03			All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Packaging Requirements

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
3.01	Packaging	Belkin branded packaging. May require special channel packaging variants (Walmart).	All
3.02	Packaging	Must have compliance logos and markings.	All
3.03	Packaging	Regulatory and QSG to support multiple languages. Minimal number of sheets.	All
3.04	Packaging	Pull out tab on tray.	All

Regional Countries Required

Instructions This field is required for specification and certification planning (prior to development). Mark a "Y" for required countries only (NOT FINAL)

US		UK / EU				APeA		ANZ	
Y	Americas	Y	Austria	Y	Netherlands	Y	China	Y	Sydney
Y	Canada	Y	Belgium	Y	Poland	Y	Hong Kong	Y	Melbourne
		Y	Bulgaria	Y	Portugal	Y	Taiwan	Y	Perth
		Y	Croatia		Romania	Y	Japan	Y	Brisbane
		Y	Denmark	Y	Russia	Y	Korea		
		Y	Finland	Y	Spain	Y	Malaysia		
		Y	France	Y	Sweden	Y	Singapore		
		Y	Germany		Turkey	Y	Thailand		
		Y	Greece	Y	United Kingdom	Y	Philippines		
		Y	Hungary				India		
		Y	Ireland				Indonesia		
		Y	Italy						
			Luxembourg						

Note: All Compliance markings and statements required on product and packaging will require RC validation and sign-off. Please use the latest RC Document (RS-00348) located in agile for guidance.

PGM02791
WORM

PAGE 1



Project Objective	
Differentiation	✓
Neutralization	
First to Market	
Cost Leadership	

Project WORM

PGM02791 – BATTERY PACKS

Product Manager: Fred Gransee
Product Dev. Manager: Edward Leu

Release Notes

Release	Date	Author	Notes
1.0	11/21/2016	Edward L.	Initial Draft.
2.0	12/15/2106	Edward L.	Update on estimated product dimensions, clarify green LED wavelength. Clarify 2.4A input. Update Product Manager name. Add Program Number.

SUMMARY

Description

Instructions: Write a short paragraph that describes what this product is. This statement should be derived from and supported by the PVP document.

Objective:

Expand our portable power accessory offering and leverage our battery pack capabilities. Continue to grow and gain market share in portable charging market by growing and elaborating on fast charging, multi-device, portability and safety story.

Target Market:

Smartphone / Tablet Users, BT Headphones / BT Speakers, Action Cameras /
Retailers: Walmart, Target, Media Markt, Dixon, JB Hifi, Belkin.com

Key Product Features:

Project Worm 1		Project Worm 2		Project Worm 3	
Capacity	4000mAh	Capacity	8000mAh	Capacity	12000mAh
Battery Type	Polymer	Battery Type	Polymer	Battery Type	Polymer
Output Port	1 USB-A	Output Port	2 USB-A	Output Port	2 USB-A
Output Amps	2.4A	Output Amps	2.4A (shared)	Output Amps	3.4A (shared)*
Input Port	m-USB	Input Port	m-USB	Input Port	m-USB
Input Amps	2.4A*	Input Amps	2.4A*	Input Amps	2.4A*
Cable	6" m-USB	Cable	6" m-USB	Cable	6" m-USB
LED	4 Lights	LED	4 Lights	LED	4 Lights
Housing	Plastic-PC	Housing	Plastic-PC	Housing	Plastic-PC
MFI capable				* Option to go 2.4A + 1.0A for MFI	

Product Life: 2-3 years

Warranty: 2 year limited warranty. CEW.

Estimated Annual Forecast: 1.25million (includes all three models)

USE CASE & ACCEPTANCE CRITERIA

USE CASE #1, On-The-Go Mobile User

Samantha takes public transportation to get to and from work but also to other events. When she's commuting she uses her smartphone to listen to music and play games. After a day's use for emails, calls and social media her phone is running out of juice. No outlets on buses and trains prevents her from charging her phone. This is the perfect situation for having a battery pack.

USE CASE #2, Multi-Device Compatibility

Chris is a vlogger and an early technology adopter who recently bought the Samsung S7 that has USB-C. Chris also owns an older tablet that uses m-USB and a GoPro Hero 3 which uses mini USB. He cannot be out of power for the ideal interview. In order for Chris to be prepared he would need a battery pack with multiple ports with different connectors.

USE CASE #3, Heavy Mobile User

Luke is a Sales Rep and is constantly traveling. He travels with his laptop, tablet and smartphone. He also has his Bluetooth headphones to listen to on the flight. He forgot to charge some of his devices and will not be prepared to go straight to work with the lack of USB/outlets on planes to provide the high current he would need. This is the ideal time for a high capacity battery to charge all devices.

USE CASE #4, At Home

Stephanie is relaxing over the weekend at her apartment but she forgot to charge her iPhone overnight. She's communicating with family about planning a surprise party. She needs to charge her iPhone to keep the conversation going but doesn't want to be tied to a wall socket because she needs to research on her computer as well. Outlets are not close enough so having a battery pack to charge her phone is ideal in this situation.

ACCEPTANCE CRITERIA**Fast Charging, Multi-Device**

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- Charge other devices such as BT speakers, headphones, action cameras and others

Portability

- Thinner battery packs allow for easier transportation when on-the-go
- Compact design enables consumer to easily place into
- Materials to withstand everyday travel such as scratches, nicks, and drops
- Prevent wear and tear look with housing material on battery pack when transporting in bags with other devices

Safety & Quality

- Conduct electrical testing to batteries to ensure protection when charging devices (circuit, current, voltage, discharge)
- Efficient battery cells that provide maximum output of power while also being safe during use
- Battery shuts off when electrical surges or if dropping occurs before, during or after charging devices

WORM 1

- Introducing a battery pack that provides 2 charging cycles for a smartphone. Multi-port enables for simultaneous at fast charging speeds.
- The consumer who only needs to charge once through-out the day to top off the mobile device to keep them going into the night.
- The consumer who uses their smartphone at home while watching TV who needs a compact solution to carry around the house to listen to music while completing tasks.

WORM 2

- Provide a 8,000 mAh battery that can quickly charge mobile devices but also be portable enough to place in a pocket or bag when on-the-go.
- The consumer who needs to utilize their smartphone for work and personal usage but are quickly depleting the battery due to data usage and App usage.
- The always on-the-go consumer who is unable to find an outlet available but needs to charge their mobile device.

WORM 3

- Provide a 12,000 mAh battery for the consumer who travels with multiple devices. Multi-port enables the consumer to charge 2 devices at once. Fast charging output saves time.
- A user who charges 2-3 times a day because the mobile devices are being used to record interviews which uses high quality video and depletes the battery.
- The consumer who travels and needs to keep their headphones or tablet charged without worrying about how many wall plugs are needed for the trip.

Sketch and/or Feature Block Diagram

Instructions: Provide a conceptual drawing of what the product may look like and/or a *feature-block diagram* illustrating how the various product components or functions interact with each other. If no drawing exists, roughly draw the concept to provide visual cues as to what this product is.

(FPO – Design Subject to change)

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(FPO – Design Subject to change)

CEC 迪比科 | 全球领先的移动电源品牌 | 产品广泛应用于消费电子、工业、医疗、通信等领域



(FPO – Design Subject to change)

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(FPO – Design Subject to change)

Capacity(mAH)	4,000	8,000	12,000
estimate the size L*W*H(mm)	140*75*7.5mm	140*75*13mm	153.6*70*15mm
Convert to Inches	5.5" x 2.95" x 0.3"	5.5" x 2.95" x 0.5"	6" x 2.75" x 0.59"
Belkin Standard Size (packaging proposal)	6" x 4" x 1" (existing F8M989 6600mAh) OR 8" x 4" x 1" (existing F8M993)	6" x 4" x 1" (existing F8M989 6600mAh) OR 8" x 4" x 1" (existing F8M993)	8" x 4" x 1" (existing F8M993)

Features and Requirements

Instructions: What features are required for this product? These requirements should be derived from and supported by the PVP document. This section is completed by Product Management with cross functional inputs from the scoping phase. Note that detailed specifications will be defined separately in the Product Technical Specification document by Functional Leaders. The information provided in this Product Requirements document must provide enough detail to begin the construction of the Product Technical Specification documentation.

Base Requirements for ALL Product Variations:

Instructions: What features are required for all variations of this product? Remember to leverage any common platforms developed to date by Belkin (ie. common OS, Network, UI, Cloud, etc...)

To add rows in the tables, position the cursor in the table, go to the table menu, then select Insert > Rows Above (or Rows Below).

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
1.01	Design	Belkin design touch-up of existing vendor design.	All
1.02	Design	Colors to follow Belkin CMF standard. Rose gold, silver and black.	All
1.03	Design	LED color. Belkin green. Wavelength 575nm. Reference existing product NIKE (F8J201) for brightness level.	All
1.04	Design	Belkin logo position. Painted or embossed? TBD.	All
1.05	Function	4 LED indicator displays the battery capacity. A push-button will turn-on the 4 LED indicator and start device charging (when in sleep mode).	All
1.06	Function	Auto-start. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.	All
1.07	Function	Auto-sleep. If no activity is detected on the USB-A port (less than XXX mA), the battery pack will go into sleep-mode. The USB ports will turn off.	All
1.08	Function	Output when connected to the charging input.	All
1.09	Function	MFI capable. At least one model in the product line, ideally the most affordable, needs to be MFI capable. (like to have)	All
1.10	Engineering	Micro-USB cable must be Charge/Sync (4-wire conductor). Micro-USB cable to be in black color with Belkin logo on the molded ends. No markings on the cable section.	All
1.11	Engineering	Output D+/D- resistors. Need to get the details.	All

1.12	Engineering	Input charging power (rated vs expected)	All
1.13	HWQA	Old devices. 3 years old. Should not be considered a priority.	All
1.14	Reliability	Battery Packs must meet and comply with all reliability requirements for all regions (Reference Rel. Test Plan)	All
1.15	Sustainability	Product materials must meet and comply with all sustainability requirements for all regions (Reference Sustainability test plan)	All
1.16	Regulatory Compliance	Battery Packs must meet and comply with all regulatory compliance requirements for all regions (Reference RC Test Plan)	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Optional Requirements for ALL Product Variations:

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
2.01	Engineering	Efficiency. TBD.	All
2.02	Engineering	MFI for all battery pack models. Shared ports are not allowed and will be a problem on dual port models. An option for fixed ports (silkscreen and resistor settings) should be provided.	All
2.03	Engineering	Input 2.4A. micro-USB female and cables will limit the input charge current below 2.4A. The must have is to make sure the circuitry is robust enough to handle 2.4A input and the product is okay to charge at a lower max. peak input current ~1.5 to 2.0A.	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Packaging Requirements

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
3.01	Packaging	Belkin branded packaging. May require special channel packaging variants (Walmart).	All
3.02	Packaging	Must have compliance logos and markings.	All
3.03	Packaging	Regulatory and QSG to support multiple languages. Minimal number of sheets.	All
3.04	Packaging	Pull out tab on tray.	All

Regional Countries Required

Instructions This field is required for specification and certification planning (prior to development). Mark a "Y" for required countries only
(NOT FINAL)

US		UK / EU			APeA		ANZ		
Y	Americas	Y	Austria	Y	Netherlands	Y	China	Y	Sydney
Y	Canada	Y	Belgium	Y	Poland	Y	Hong Kong	Y	Melbourne
		Y	Bulgaria	Y	Portugal	Y	Taiwan	Y	Perth
		Y	Croatia		Romania	Y	Japan	Y	Brisbane
		Y	Denmark	Y	Russia	Y	Korea		
		Y	Finland	Y	Spain	Y	Malaysia		
		Y	France	Y	Sweden	Y	Singapore		
		Y	Germany		Turkey	Y	Thailand		
		Y	Greece	Y	United Kingdom	Y	Philippines		
		Y	Hungary				India		
		Y	Ireland				Indonesia		
		Y	Italy						
			Luxembourg						

Note: All Compliance markings and statements required on product and packaging will require RC validation and sign-off. Please use the latest RC Document (RS-00348) located in agile for guidance.



Project Objective	
Differentiation	✓
Neutralization	✓
First to Market	
Cost Leadership	✓

Project WORM

PGM02791 – BATTERY PACKS

Product Manager: Fred Gransee
Product Dev. Manager: Edward Leu

Release Notes

Release	Date	Author	Notes
1.0	11/21/2016	Edward L.	Initial Draft.
2.0	12/15/2106	Edward L.	Update on estimated product dimensions, clarify green LED wavelength. Clarify 2.4A input. Update Product Manager name. Add Program Number.
3.0	01/12/2017	Edward L.	Update from 4k/8k/12k to 5k/10k/15k. Add FPO images. Clarify MFI, Charge-Pass Thru, and Auto-Detect Features. Update use cases for headphones, wearables, speakers, drones, tablets, and computers.

SUMMARY

Description

Instructions: Write a short paragraph that describes what this product is. This statement should be derived from and supported by the PVP document.

Objective:

Expand our portable power accessory offering and leverage our battery pack capabilities. Continue to grow and gain market share in portable charging market by growing and elaborating on fast charging, multi-device, portability and safety story.

Target Market:

*Smartphone / Tablet Users, BT Headphones / BT Speakers, Action Cameras /
Retailers: Walmart, Target, Media Markt, Dixon, JB Hifi, Belkin.com*

Key Product Features:

	WORM 1	WORM 2	WORM 3
Capacity	5000mAh	10,000mAh	15,000mAh
Battery Type	Polymer		
Output Port	1 USB-A	2 USB-A	2 USB-A
Output Amps	2.4A	2.4A (shared)	3.4A (shared)
Input Port	Micro-USB		
Input Amps	2.4A* (See Section 2.03)		
Cable	6" micro-USB male to USB-A male		
LED	4-LED indicator		
Housing	Plastic - PC		

Product Life: 2-3 years

Warranty: 2 year limited warranty. CEW.

Estimated Annual Forecast: 650k total (includes all three models)

USE CASE & ACCEPTANCE CRITERIA

USE CASE #1, On-The-Go Mobile User

Samantha takes public transportation to get to and from work but also to other events. When she's commuting she uses her smartphone to listen to music and play games. After a day's use for emails, calls and social media her phone is running out of juice. No outlets on buses and trains prevents her from charging her phone. This is the perfect situation for having a battery pack.

USE CASE #2, Multi-Device Compatibility

Chris is a vlogger and an early technology adopter who recently bought the Samsung S7 that has USB-C. Chris also owns an older tablet that uses m-USB and a GoPro Hero 3 which uses mini USB. He cannot be out of power for the ideal interview. In order for Chris to be prepared he would need a battery pack with multiple ports with different connectors.

USE CASE #3, Heavy Mobile User

Luke is a Sales Rep and is constantly traveling. He travels with his laptop, tablet and smartphone. He also has his Bluetooth headphones to listen to on the flight. He forgot to charge some of his devices and will not be prepared to go straight to work with the lack of USB/outlets on planes to provide the high current he would need. This is the ideal time for a high capacity battery to charge all devices.

USE CASE #4, At Home

Stephanie is relaxing over the weekend at her apartment but she forgot to charge her iPhone overnight. She's communicating with family about planning a surprise party. She needs to charge her iPhone to keep the conversation going but doesn't want to be tied to a wall socket because she needs to research on her computer as well. Outlets are not close enough so having a battery pack to charge her phone is ideal in this situation.

USE CASE #4, Retail Packaging

Retail packaging side panel will shift away from only calling out smartphone brands and models. The side panel will feature icons that indicate use with headphones, wearables, speakers, drones, tablets, and computers.



(FPO – Design Subject to change)

ACCEPTANCE CRITERIA**Fast Charging, Multi-Device**

- Optimal charge-out for devices that require higher speeds of charging
- Optimal charge-in for battery packs that allow for faster and shorter time of charging
- Plug up to 2 devices at the same time to the battery
- Charge other devices such as BT speakers, headphones, action cameras and others

Portability

- Thinner battery packs allow for easier transportation when on-the-go
- Compact design enables consumer to easily place into
- Materials to withstand everyday travel such as scratches, nicks, and drops
- Prevent wear and tear look with housing material on battery pack when transporting in bags with other devices

Safety & Quality

- Conduct electrical testing to batteries to ensure protection when charging devices (circuit, current, voltage, discharge)
- Efficient battery cells that provide maximum output of power while also being safe during use
- Battery shuts off when electrical surges or if dropping occurs before, during or after charging devices

WORM 1

- Introducing a battery pack that provides 2 charging cycles for a smartphone. Multi-port enables for simultaneous at fast charging speeds.
- The consumer who only needs to charge once through-out the day to top off the mobile device to keep them going into the night.
- The consumer who uses their smartphone at home while watching TV who needs a compact solution to carry around the house to listen to music while completing tasks.

WORM 2

- Provide a 10,000 mAh battery that can quickly charge mobile devices but also be portable enough to place in a pocket or bag when on-the-go.
- The consumer who needs to utilize their smartphone for work and personal usage but are quickly depleting the battery due to data usage and App usage.
- The always on-the-go consumer who is unable to find an outlet available but needs to charge their mobile device.

WORM 3

- Provide a 15,000 mAh battery for the consumer who travels with multiple devices. Multi-port enables the consumer to charge 2 devices at once. Fast charging output saves time.
- A user who charges 2-3 times a day because the mobile devices are being used to record interviews which uses high quality video and depletes the battery.
- The consumer who travels and needs to keep their headphones or tablet charged without worrying about how many wall plugs are needed for the trip.

Sketch and/or Feature Block Diagram

Instructions: Provide a conceptual drawing of what the product may look like and/or a *feature-block diagram* illustrating how the various product components or functions interact with each other. If no drawing exists, roughly draw the concept to provide visual cues as to what this product is.

(FPO – Design Subject to change)



(FPO – Design Subject to change)

Features and Requirements

Instructions: What features are required for this product? These requirements should be derived from and supported by the PVP document. This section is completed by Product Management with cross functional inputs from the scoping phase. Note that detailed specifications will be defined separately in the Product Technical Specification document by Functional Leaders. The information provided in this Product Requirements document must provide enough detail to begin the construction of the Product Technical Specification documentation.

Base Requirements for ALL Product Variations:

Instructions: What features are required for all variations of this product? Remember to leverage any common platforms developed to date by Belkin (ie. common OS, Network, UI, Cloud, etc...)

To add rows in the tables, position the cursor in the table, go to the table menu, then select Insert > Rows Above (or Rows Below).

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
1.01	Design	Belkin design touch-up of existing vendor design.	All
1.02	Design	Colors to follow Belkin CMF standard. Rose gold, silver and black.	All
1.03	Design	LED color. Belkin green. Wavelength 575nm. Reference existing product NIKE (F8J201) for brightness level.	All
1.04	Design	Belkin logo. Pad Printed.	All
1.05	Function	4 LED indicators displays the battery capacity. A push-button will turn-on the 4 LED indicator and start device charging (when in sleep mode).	All
1.06	Function	Auto-start. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.	All
1.07	Function	Auto-sleep. If no activity is detected on the USB-A port (less than XXX mA, see EE spec), the battery pack will go into sleep-mode. The USB ports will turn off.	All
1.08	Function	Charge Pass-Thru not supported. The product will not feature charge pass-thru. When the product is connected to a charging input, the output will be turned off.	All
1.09	Function	MFI capable. At least one model in the product line, ideally the most affordable, needs to be MFI capable. (like to have)	All
1.10	Engineering	Micro-USB cable must be Charge/Sync (4-wire conductor). Micro-USB cable to be in black color with Belkin logo on the molded ends. No markings on the cable section.	All
1.11	Engineering	Must-Have. Fixed output D+/D- resistors (see EE spec). Nice-to-Have: BC1.2 compatible D+/D- detection.	All

1.12	Engineering	Input charging power (rated vs expected). Standard setup will be Apple 10W charger (5V, 2.1A) with 6" micro-USB cable that is included with the product.	All
1.13	HWQA	Old smartphone devices. Greater than 3 years old. should not be considered a priority.	All
1.14	Reliability	Battery Packs must meet and comply with all reliability requirements for all regions (Reference Rel. Test Plan)	All
1.15	Sustainability	Product materials must meet and comply with all sustainability requirements for all regions (Reference Sustainability test plan)	All
1.16	Regulatory Compliance	Battery Packs must meet and comply with all regulatory compliance requirements for all regions (Reference RC Test Plan)	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Optional Requirements for ALL Product Variations:

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
2.01	Engineering	Efficiency. See EE Spec.	All
2.02	Engineering	MFI for all battery pack models. Shared ports are not allowed and will be a problem on dual port models. An option for fixed ports (silkscreen and resistor settings) should be provided.	All
2.03	Engineering	Input 2.4A. micro-USB female and cables will limit the input charge current below 2.4A. The must have is to make sure the circuitry is robust enough to handle 2.4A input and the product is okay to charge at a lower max. peak input current ~1.5 to 2.0A.	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Packaging Requirements

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
3.01	Packaging	Belkin branded packaging. May require special channel packaging variants (Walmart).	All
3.02	Packaging	Must have compliance logos and markings.	All
3.03	Packaging	Regulatory and QSG to support multiple languages. Minimal number of sheets.	All
3.04	Packaging	Pull out tab on tray.	All

Regional Countries Required

Instructions This field is required for specification and certification planning (prior to development). Mark a "Y" for required countries only
(NOT FINAL)

US		UK / EU			APeA		ANZ		
Y	Americas	Y	Austria	Y	Netherlands	Y	China	Y	Sydney
Y	Canada	Y	Belgium	Y	Poland	Y	Hong Kong	Y	Melbourne
		Y	Bulgaria	Y	Portugal	Y	Taiwan	Y	Perth
		Y	Croatia		Romania	Y	Japan	Y	Brisbane
		Y	Denmark	Y	Russia	Y	Korea		
		Y	Finland	Y	Spain	Y	Malaysia		
		Y	France	Y	Sweden	Y	Singapore		
		Y	Germany		Turkey	Y	Thailand		
		Y	Greece	Y	United Kingdom	Y	Philippines		
		Y	Hungary				India		
		Y	Ireland				Indonesia		
		Y	Italy						
			Luxembourg						

Note: All Compliance markings and statements required on product and packaging will require RC validation and sign-off. Please use the latest RC Document (RS-00348) located in agile for guidance.



Project Objective	
Differentiation	✓
Neutralization	✓
First to Market	
Cost Leadership	✓

Project WORM

PGM02791 – BATTERY PACKS

Product Manager: Fred Gransee
Product Dev. Manager: Edward Leu

Release Notes

Release	Date	Author	Notes
1.0	11/21/2016	Edward L.	Initial Draft.
2.0	12/15/2106	Edward L.	Update on estimated product dimensions, clarify green LED wavelength. Clarify 2.4A input. Update Product Manager name. Add Program Number.
3.0	01/12/2017	Edward L.	Update from 4k/8k/12k to 5k/10k/15k. Add FPO images. Clarify MFI, Charge-Pass Thru, and Auto-Detect Features. Update use cases for headphones, wearables, speakers, drones, tablets, and computers.
4.0		Edward L.	Add models for compatibility (nano Drone Parrot, LG Level headphones, etc....)

SUMMARY

Description

Instructions: Write a short paragraph that describes what this product is. This statement should be derived from and supported by the PVP document.

Objective:

Expand our portable power accessory offering and leverage our battery pack capabilities. Continue to grow and gain market share in portable charging market by growing and elaborating on fast charging, multi-device, portability and safety story.

Target Market:

*Smartphone / Tablet Users, BT Headphones / BT Speakers, Action Cameras /
Retailers: Walmart, Target, Media Markt, Dixon, JB Hifi, Belkin.com*

Key Product Features:

	WORM 1	WORM 2	WORM 3
Capacity	5000mAh	10,000mAh	15,000mAh
Battery Type	Polymer		
Output Port	1 USB-A	2 USB-A	2 USB-A
Output Amps	2.4A	2.4A (shared)	3.4A (shared)
Input Port	Micro-USB		
Input Amps	2.4A* (See Section 2.03)		
Cable	6" micro-USB male to USB-A male		
LED	4-LED indicator		
Housing	Plastic - PC		

Product Life: 2-3 years

Warranty: 2 year limited warranty. CEW.

Estimated Annual Forecast: 650k total (includes all three models)

USE CASE & ACCEPTANCE CRITERIA

USE CASE #1, On-The-Go Mobile User

Samantha takes public transportation to get to and from work but also to other events. When she's commuting she uses her smartphone to listen to music and play games. After a day's use for emails, calls and social media her phone is running out of juice. No outlets on buses and trains prevents her from charging her phone. This is the perfect situation for having a battery pack.

USE CASE #2, Multi-Device Compatibility

Chris is a vlogger and an early technology adopter who recently bought the Samsung S7 that has USB-C. Chris also owns an older tablet that uses m-USB and a GoPro Hero 3 which uses mini USB. He cannot be out of power for the ideal interview. In order for Chris to be prepared he would need a battery pack with multiple ports with different connectors.

USE CASE #3, Heavy Mobile User

Luke is a Sales Rep and is constantly traveling. He travels with his laptop, tablet and smartphone. He also has his Bluetooth headphones to listen to on the flight. He forgot to charge some of his devices and will not be prepared to go straight to work with the lack of USB/outlets on planes to provide the high current he would need. This is the ideal time for a high capacity battery to charge all devices.

USE CASE #4, At Home

Stephanie is relaxing over the weekend at her apartment but she forgot to charge her iPhone overnight. She's communicating with family about planning a surprise party. She needs to charge her iPhone to keep the conversation going but doesn't want to be tied to a wall socket because she needs to research on her computer as well. Outlets are not close enough so having a battery pack to charge her phone is ideal in this situation.

USE CASE #4, Retail Packaging

Retail packaging side panel will shift away from only calling out smartphone brands and models. The side panel will feature icons that indicate use with headphones, wearables, speakers, drones, tablets, and computers.



(FPO – Design Subject to change)

ACCEPTANCE CRITERIA**Fast Charging, Multi-Device**

- Optimal charge-out for devices that require higher speeds of charging
- Optimal charge-in for battery packs that allow for faster and shorter time of charging
- Plug up to 2 devices at the same time to the battery
- Charge other devices such as BT speakers, headphones, action cameras and others

Portability

- Thinner battery packs allow for easier transportation when on-the-go
- Compact design enables consumer to easily place into
- Materials to withstand everyday travel such as scratches, nicks, and drops
- Prevent wear and tear look with housing material on battery pack when transporting in bags with other devices

Safety & Quality

- Conduct electrical testing to batteries to ensure protection when charging devices (circuit, current, voltage, discharge)
- Efficient battery cells that provide maximum output of power while also being safe during use
- Battery shuts off when electrical surges or if dropping occurs before, during or after charging devices

WORM 1

- Introducing a battery pack that provides 2 charging cycles for a smartphone. Multi-port enables for simultaneous at fast charging speeds.
- The consumer who only needs to charge once through-out the day to top off the mobile device to keep them going into the night.
- The consumer who uses their smartphone at home while watching TV who needs a compact solution to carry around the house to listen to music while completing tasks.

WORM 2

- Provide a 10,000 mAh battery that can quickly charge mobile devices but also be portable enough to place in a pocket or bag when on-the-go.
- The consumer who needs to utilize their smartphone for work and personal usage but are quickly depleting the battery due to data usage and App usage.
- The always on-the-go consumer who is unable to find an outlet available but needs to charge their mobile device.

WORM 3

- Provide a 15,000 mAh battery for the consumer who travels with multiple devices. Multi-port enables the consumer to charge 2 devices at once. Fast charging output saves time.
- A user who charges 2-3 times a day because the mobile devices are being used to record interviews which uses high quality video and depletes the battery.
- The consumer who travels and needs to keep their headphones or tablet charged without worrying about how many wall plugs are needed for the trip.

Sketch and/or Feature Block Diagram

Instructions: Provide a conceptual drawing of what the product may look like and/or a *feature-block diagram* illustrating how the various product components or functions interact with each other. If no drawing exists, roughly draw the concept to provide visual cues as to what this product is.

(FPO – Design Subject to change)



(FPO – Design Subject to change)

Features and Requirements

Instructions: What features are required for this product? These requirements should be derived from and supported by the PVP document. This section is completed by Product Management with cross functional inputs from the scoping phase. Note that detailed specifications will be defined separately in the Product Technical Specification document by Functional Leaders. The information provided in this Product Requirements document must provide enough detail to begin the construction of the Product Technical Specification documentation.

Base Requirements for ALL Product Variations:

Instructions: What features are required for all variations of this product? Remember to leverage any common platforms developed to date by Belkin (ie. common OS, Network, UI, Cloud, etc...)

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REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
1.01	Design	Belkin design touch-up of existing vendor design.	All
1.02	Design	Colors to follow Belkin CMF standard. Rose gold, silver and black.	All
1.03	Design	LED color. Belkin green. Wavelength 575nm. Reference existing product NIKE (F8J201) for brightness level.	All
1.04	Design	Belkin logo. Pad Printed.	All
1.05	Function	4 LED indicators displays the battery capacity. A push-button will turn-on the 4 LED indicator and start device charging (when in sleep mode).	All
1.06	Function	Auto-start. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.	All
1.07	Function	Auto-sleep. If no activity is detected on the USB-A port (less than XXX mA, see EE spec), the battery pack will go into sleep-mode. The USB ports will turn off.	All
1.08	Function	Charge Pass-Thru not supported. The product will not feature charge pass-thru. When the product is connected to a charging input, the output will be turned off.	All
1.09	Function	MFI capable. At least one model in the product line, ideally the most affordable, needs to be MFI capable. (like to have)	All
1.10	Engineering	Micro-USB cable must be Charge/Sync (4-wire conductor). Micro-USB cable to be in black color with Belkin logo on the molded ends. No markings on the cable section.	All
1.11	Engineering	Must-Have. Fixed output D+/D- resistors (see EE spec). Nice-to-Have: BC1.2 compatible D+/D- detection.	All

1.12	Engineering	Input charging power (rated vs expected). Standard setup will be Apple 10W charger (5V, 2.1A) with 6" micro-USB cable that is included with the product.	All
1.13	HWQA	Old smartphone devices. Greater than 3 years old. should not be considered a priority.	All
1.14	Reliability	Battery Packs must meet and comply with all reliability requirements for all regions (Reference Rel. Test Plan)	All
1.15	Sustainability	Product materials must meet and comply with all sustainability requirements for all regions (Reference Sustainability test plan)	All
1.16	Regulatory Compliance	Battery Packs must meet and comply with all regulatory compliance requirements for all regions (Reference RC Test Plan)	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Optional Requirements for ALL Product Variations:

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
2.01	Engineering	Efficiency. See EE Spec.	All
2.02	Engineering	MFI for all battery pack models. Shared ports are not allowed and will be a problem on dual port models. An option for fixed ports (silkscreen and resistor settings) should be provided.	All
2.03	Engineering	Input 2.4A. micro-USB female and cables will limit the input charge current below 2.4A. The must have is to make sure the circuitry is robust enough to handle 2.4A input and the product is okay to charge at a lower max. peak input current ~1.5 to 2.0A.	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

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Packaging Requirements

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
3.01	Packaging	Belkin branded packaging. May require special channel packaging variants (Walmart).	All
3.02	Packaging	Must have compliance logos and markings.	All
3.03	Packaging	Regulatory and QSG to support multiple languages. Minimal number of sheets.	All
3.04	Packaging	Pull out tab on tray.	All

Regional Countries Required

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(NOT FINAL)

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Y	Canada	Y	Belgium	Y	Poland	Y	Hong Kong	Y	Melbourne
		Y	Bulgaria	Y	Portugal	Y	Taiwan	Y	Perth
		Y	Croatia		Romania	Y	Japan	Y	Brisbane
		Y	Denmark	Y	Russia	Y	Korea		
		Y	Finland	Y	Spain	Y	Malaysia		
		Y	France	Y	Sweden	Y	Singapore		
		Y	Germany		Turkey	Y	Thailand		
		Y	Greece	Y	United Kingdom	Y	Philippines		
		Y	Hungary				India		
		Y	Ireland				Indonesia		
		Y	Italy						
			Luxembourg						

Note: All Compliance markings and statements required on product and packaging will require RC validation and sign-off. Please use the latest RC Document (RS-00348) located in agile for guidance.



Project Objective	
Differentiation	✓
Neutralization	✓
First to Market	
Cost Leadership	✓

Project WORM

PGM02791 – BATTERY PACKS

Product Manager: Fred Gransee
Product Dev. Manager: Edward Leu

Release Notes

Release	Date	Author	Notes
1.0	11/21/2016	Edward L.	Initial Draft.
2.0	12/15/2106	Edward L.	Update on estimated product dimensions, clarify green LED wavelength. Clarify 2.4A input. Update Product Manager name. Add Program Number.
3.0	01/12/2017	Edward L.	Update from 4k/8k/12k to 5k/10k/15k. Add FPO images. Clarify MFI, Charge-Pass Thru, and Auto-Detect Features. Update use cases for headphones, wearables, speakers, drones, tablets, and computers.
4.0	02/02/2017	Edward L.	Add models for compatibility (nano Drone Parrot, LG Level headphones, etc....)
5.0	04/17/2017	Edward L.	Remove India and Indonesia from Regulatory Compliance requirements.

SUMMARY

Description

Instructions: Write a short paragraph that describes what this product is. This statement should be derived from and supported by the PVP document.

Objective:

Expand our portable power accessory offering and leverage our battery pack capabilities. Continue to grow and gain market share in portable charging market by growing and elaborating on fast charging, multi-device, portability and safety story.

Target Market:

*Smartphone / Tablet Users, BT Headphones / BT Speakers, Action Cameras /
Retailers: Walmart, Target, Media Markt, Dixon, JB Hifi, Belkin.com*

Key Product Features:

	WORM 1	WORM 2	WORM 3
Capacity	5000mAh	10,000mAh	15,000mAh
Battery Type	Polymer		
Output Port	1 USB-A	2 USB-A	2 USB-A
Output Amps	2.4A	2.4A (shared)	3.4A (shared)
Input Port	Micro-USB		
Input Amps	2.4A* (See Section 2.03)		
Cable	6" micro-USB male to USB-A male		
LED	4-LED indicator		
Housing	Plastic - PC		

Product Life: 2-3 years

Warranty: 2 year limited warranty. CEW.

Estimated Annual Forecast: 650k total (includes all three models)

USE CASE & ACCEPTANCE CRITERIA

USE CASE #1, On-The-Go Mobile User

Samantha takes public transportation to get to and from work but also to other events. When she's commuting she uses her smartphone to listen to music and play games. After a day's use for emails, calls and social media her phone is running out of juice. No outlets on buses and trains prevents her from charging her phone. This is the perfect situation for having a battery pack.

USE CASE #2, Multi-Device Compatibility

Chris is a vlogger and an early technology adopter who recently bought the Samsung S7 that has USB-C. Chris also owns an older tablet that uses m-USB and a GoPro Hero 3 which uses mini USB. He cannot be out of power for the ideal interview. In order for Chris to be prepared he would need a battery pack with multiple ports with different connectors.

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Luke is a Sales Rep and is constantly traveling. He travels with his laptop, tablet and smartphone. He also has his Bluetooth headphones to listen to on the flight. He forgot to charge some of his devices and will not be prepared to go straight to work with the lack of USB/outlets on planes to provide the high current he would need. This is the ideal time for a high capacity battery to charge all devices.

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Stephanie is relaxing over the weekend at her apartment but she forgot to charge her iPhone overnight. She's communicating with family about planning a surprise party. She needs to charge her iPhone to keep the conversation going but doesn't want to be tied to a wall socket because she needs to research on her computer as well. Outlets are not close enough so having a battery pack to charge her phone is ideal in this situation.

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- Compact design enables consumer to easily place into
- Materials to withstand everyday travel such as scratches, nicks, and drops
- Prevent wear and tear look with housing material on battery pack when transporting in bags with other devices

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- Efficient battery cells that provide maximum output of power while also being safe during use
- Battery shuts off when electrical surges or if dropping occurs before, during or after charging devices

WORM 1

- Introducing a battery pack that provides 2 charging cycles for a smartphone. Multi-port enables for simultaneous at fast charging speeds.
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- The consumer who uses their smartphone at home while watching TV who needs a compact solution to carry around the house to listen to music while completing tasks.

WORM 2

- Provide a 10,000 mAh battery that can quickly charge mobile devices but also be portable enough to place in a pocket or bag when on-the-go.
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- The always on-the-go consumer who is unable to find an outlet available but needs to charge their mobile device.

WORM 3

- Provide a 15,000 mAh battery for the consumer who travels with multiple devices. Multi-port enables the consumer to charge 2 devices at once. Fast charging output saves time.
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(FPO – Design Subject to change)



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Instructions: What features are required for all variations of this product? Remember to leverage any common platforms developed to date by Belkin (ie. common OS, Network, UI, Cloud, etc...)

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1.04	Design	Belkin logo. Pad Printed.	All
1.05	Function	4 LED indicators displays the battery capacity. A push-button will turn-on the 4 LED indicator and start device charging (when in sleep mode).	All
1.06	Function	Auto-start. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.	All
1.07	Function	Auto-sleep. If no activity is detected on the USB-A port (less than XXX mA, see EE spec), the battery pack will go into sleep-mode. The USB ports will turn off.	All
1.08	Function	Charge Pass-Thru not supported. The product will not feature charge pass-thru. When the product is connected to a charging input, the output will be turned off.	All
1.09	Function	MFI capable. At least one model in the product line, ideally the most affordable, needs to be MFI capable. (like to have)	All
1.10	Engineering	Micro-USB cable must be Charge/Sync (4-wire conductor). Micro-USB cable to be in black color with Belkin logo on the molded ends. No markings on the cable section.	All
1.11	Engineering	Must-Have. Fixed output D+/D- resistors (see EE spec). Nice-to-Have: BC1.2 compatible D+/D- detection.	All

1.12	Engineering	Input charging power (rated vs expected). Standard setup will be Apple 10W charger (5V, 2.1A) with 6" micro-USB cable that is included with the product.	All
1.13	HWQA	Old smartphone devices. Greater than 3 years old. should not be considered a priority.	All
1.14	Reliability	Battery Packs must meet and comply with all reliability requirements for all regions (Reference Rel. Test Plan)	All
1.15	Sustainability	Product materials must meet and comply with all sustainability requirements for all regions (Reference Sustainability test plan)	All
1.16	Regulatory Compliance	Battery Packs must meet and comply with all regulatory compliance requirements for all regions (Reference RC Test Plan)	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Optional Requirements for ALL Product Variations:

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
2.01	Engineering	Efficiency. See EE Spec.	All
2.02	Engineering	MFI for all battery pack models. Shared ports are not allowed and will be a problem on dual port models. An option for fixed ports (silkscreen and resistor settings) should be provided.	All
2.03	Engineering	Input 2.4A. micro-USB female and cables will limit the input charge current below 2.4A. The must have is to make sure the circuitry is robust enough to handle 2.4A input and the product is okay to charge at a lower max. peak input current ~1.5 to 2.0A.	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Packaging Requirements

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
3.01	Packaging	Belkin branded packaging. May require special channel packaging variants (Walmart).	All
3.02	Packaging	Must have compliance logos and markings.	All
3.03	Packaging	Regulatory and QSG to support multiple languages. Minimal number of sheets.	All
3.04	Packaging	Pull out tab on tray.	All

Regional Countries Required

Instructions This field is required for specification and certification planning (prior to development). Mark a "Y" for required countries only
(NOT FINAL)

US		UK / EU			APeA		ANZ		
Y	Americas	Y	Austria	Y	Netherlands	Y	China	Y	Sydney
Y	Canada	Y	Belgium	Y	Poland	Y	Hong Kong	Y	Melbourne
		Y	Bulgaria	Y	Portugal	Y	Taiwan	Y	Perth
		Y	Croatia		Romania	Y	Japan	Y	Brisbane
		Y	Denmark	Y	Russia	Y	Korea		
		Y	Finland	Y	Spain	Y	Malaysia		
		Y	France	Y	Sweden	Y	Singapore		
		Y	Germany		Turkey	Y	Thailand		
		Y	Greece	Y	United Kingdom	Y	Philippines		
		Y	Hungary			N	India		
		Y	Ireland			N	Indonesia		
		Y	Italy						
			Luxembourg						

Note: All Compliance markings and statements required on product and packaging will require RC validation and sign-off. Please use the latest RC Document (RS-00348) located in agile for guidance.

PGMXXXXX
MPP103 Lightning Pocket Power

PAGE 1



Project Objective	
Differentiation	✓
Neutralization	✓
First to Market	✓
Cost Leadership	✓

Project MPP103**PGMXXXXX – Lightning Pocket Power**

Product Manager: Nick Kalra

Product Dev. Manager: Edward Leu

Release Notes

Release	Date	Author	Notes
1.0	10/11/2017	Edward L.	Initial Draft.

SUMMARY**Description**

Instructions: Write a short paragraph that describes what this product is. This statement should be derived from and supported by the PVP document.

Objective:

- A battery pack that will charge a iPhone 8 on the go that only needs one cable to charge in and out. (MPP103-1,2)
- A battery pack with cable holster that will charge a iPhone 8 on the go that only needs one cable to charge in and out. (MPP103-3)

Target Market & Customer:

- Consumers who are commuting back and forth on public transportation without access to wall outlets. They will need something portable and small.
- Consumer who uses their iPhone 8 at work to answer emails, calls, and text. They are constantly in meetings without charging capabilities.

Key Product Features:

MPP103-1	MPP103-2	MPP103-3
<ul style="list-style-type: none"> •5,000 mAh •USB-A 2.4A Output •Lighting Receptacle Input •4 LED lights •Belkin Safety Features •Compact / Thin •Soft-touch and Plastic Enclosure Options •3-4 SKU Colorway 	<ul style="list-style-type: none"> •10,000 mAh •2x USB-A 3.4A Total Output •Lighting Receptacle Input •4 LED lights •Belkin Safety Features •Compact / Thin •Soft-touch and Plastic Enclosure Options •3-4 SKU Colorway 	<ul style="list-style-type: none"> •10,000 mAh •2x USB-A 3.4A Total Output •Lighting Receptacle Input •4 LED lights •Belkin Safety Features •Compact / Thin •Soft-Touch Enclosure •3-4 SKU Colorway •Cable Holster (MPP 103-3 Only) •Cable USB-A To LTG (MPP 103-3 Only) •Cable Length Of The MPP
• SRP \$39.95	• SRP \$59.95	• SRP \$79.95
• Volumes 268,540	• Volumes 374,160	• Volumes 45,920

Product Life: 3-4 years**Warranty:** 2 year limited warranty

USE CASE

Commute/Travel

Amy is on the bus to get to work. The commute is 45 minutes until she reaches her stop then she walks 10 minutes until she goes to work. Amy unlocks her iPhone 8 to check her work email, but realizes she has 10% battery power left. To keep working, she takes out her 5000 mAh Power Pack that has 75% capacity left which is indicated by her 4 LED light indicator which has 3 LED lights lit up when she pressed the LED light button.

She plugs in her phone with her 6" USB-A to LTG cable. As the phone is plugged in, she puts the Power Pack flat against her phone while the two devices are connected. She continues to send work emails until she reaches her stop. She puts both devices in her purse, happy that the soft-touch Power Pack enclosure doesn't scratch her phone. She continues to walk to work.

Once she is at the office, Amy wants to recharge her power pack. She uses her same 6" USB-A cable to LTG cable to charge her power pack with her wall charger.

Night Use

Sandy is winding down from her work day as she enters her bedroom. She gets into her bed and realizes both her iPhone 8+ and Power Pack are almost out of power, respectively 20% and 25% power left. Sandy has a dual charge dock with lightning ports. She docks both her devices in the dual port dock. She is happy that she can charge her power pack on the dock since the lightning port is center on the bottom of the power pack which allows the power pack to rest evenly on the device support arm. She feels confident that both devices will be fully charged when she wakes up so she is ready for her work day.

Point of Purchase

Roger walks into Best Buy to buy a power pack for his iPhone X. When he comes to the section for power packs, he sees variety of different options of power packs. He glances down the callout labels and notices that each power pack tells how many more times a phone he can charge. Roger often run's out of talk time by 12pm and needs 8 more 11 hours a day. He see's that the 10000 mAh power pack has 50 hours* of talk time while the 5000 mAh that has 25 hours*. He wants as many hours as possible so he knows he wants 10000 mAh. Next he sees a callout that says the power pack design for iPhone users. He finds he doesn't need to carry a micro-usb cable anymore with a lightning port. Also, he can charge his power pack on his charge dock since it the lightning port. The power pack is labeled to be scratch-resistant and lightweight/thin, which are features Roger is looking for since he is uses the power pack on the go.

ACCEPTANCE CRITERIA

Product Expectations

Notifications of how much capacity is left in the power pack.

Enough capacity to charge a smartphone 25-50 hours.

Meet 2019 Thermal Regulations.

Able to charge and use mobile device at the same time.

Easy to carry and charge a mobile device when in a bag.

Can charge the power pack on a charging dock (Apple and Belkin charge dock compatibility).

MPP 103-1

-Max Size: 4.86 x 2.49 x .51 in

-Max Weight: .29 lbs

MPP 103-2

-Max Size: 5.76 x 2.92 x .62 in

-Max Weight: .49 lbs

MPP 103-2

-Max Size: 5.76 x 3.50 x .62 in

-Max Weight: .60 lbs

-Cable Holster Length of MPP

-LTG Cable Included

-Soft-Touch Only

Future Considerations

- iOS Notifications

- USB-C Fast-charging

Sketch and/or Feature Block Diagram

Instructions: Provide a conceptual drawing of what the product may look like and/or a *feature-block diagram* illustrating how the various product components or functions interact with each other. If no drawing exists, roughly draw the concept to provide visual cues as to what this product is.

(FPO – Design Subject to change)

(FPO – Design Subject to change)

Features and Requirements

Instructions: What features are required for this product? These requirements should be derived from and supported by the PVP document. This section is completed by Product Management with cross functional inputs from the scoping phase. Note that detailed specifications will be defined separately in the Product Technical Specification document by Functional Leaders. The information provided in this Product Requirements document must provide enough detail to begin the construction of the Product Technical Specification documentation.

Base Requirements for ALL Product Variations:

Instructions: What features are required for all variations of this product? Remember to leverage any common platforms developed to date by Belkin (ie. common OS, Network, UI, Cloud, etc...)

To add rows in the tables, position the cursor in the table, go to the table menu, then select Insert > Rows Above (or Rows Below).

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
1.01	Reliability	Product must meet and comply with all reliability requirements for all regions (Reference Reliability plan) (RTS & CTQ)	All
1.02	Sustainability	Product materials must meet and comply with all sustainability requirements for all regions (Reference Sustainability plan)	All
1.03	Regulatory Compliance	Product must meet and comply with all regulatory compliance requirements for all regions (Reference RC plan)	All
1.04	HardwareQA	Product must meet compatibility requirements (Reference HWQA plan)	All
1.05	Function	Product must have similar LED and button UX to existing Belkin products.	All
1.06	Function	Auto-start. When a USB-A cable is connected to the battery pack, the output port will turn-on and immediately start charging.	All
1.07	Function	Auto-sleep. If not activity is detected on the USB-A port (less than XXX mA, see EE spec), the battery pack will go into sleep-mode. The USB ports will turn off.	All
1.08	Function	MFI approved product. Product will be submitted for MFI approval.	All
1.09	Function	Charge pass-thru required. Open discussion on scenario behavior where input charger provides less power than the outputs consume.	All
1.10	Engineering	Must-Have. Fixed output D+/D- resistors (see EE spec). Nice-to-Have: BC1.2 compatible D+/D- detection.	All
1.11	Engineering	Input charging time will be based on Apple supplied power adaptors.	All
1.12	Compatibility	Old smartphone devices that are greater than 3 years old from launch date will not be considered a priority.	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Optional Requirements for ALL Product Variations:

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
2.01	Engineering and Reliability	Max. Input 2.4A. For a 5000mAh battery, the charge rate is typically 0.2C to 0.5C. Any higher charge rate may be subject to costlier cells. While the battery cell and system may be capable of handling Input 2.4A, the rate life expectancy of the cell may differ. This requirement is optional as the use case of this situation is highly subjective and may not be relevant.	All
2.02	Engineering	Dual 3.4A shared outputs may need to be fixed to one USB-A to 1.0A and one USB-A to 2.4A. This is due to MFI requirements. In addition, the ports may need to be marked per MFI requirements.	All
2.03	Design	The product length may need to be extended from existing Pocket Power length due to centered female Lightning connector (if two PCB boards are required).	All

*Function, Design, Engineering, Packaging, Regulatory, Warranty, Testing and Others.

**All EMEA, APAC, ANZ and Americas.

Packaging Requirements

REF	CATEGORY*	REQUIREMENTS – MUST HAVES FOR ALL VERSIONS	REGIONAL VERSION**
3.01	Packaging	Apple Retail packaging for Apple Channel SKUs.	All
3.02	Packaging	Belkin packaging for Worldwide SKUs.	All
3.03	Packaging	Regulatory and QSG to support multiple languages	All

Regional Countries Required

Instructions This field is required for specification and certification planning (prior to development). Mark a "Y" for required countries only(NOT FINAL)

Launch Plan & Certification by Country

Americas	EMEA	APEA	ANZ	Americas	EMEA	APEA	ANZ
Y Americas	Y Austria	Y China	Y New Zealand	Y FCC	Y CE	Y KC Safety	Y RCM
Y Canada	Y Belgium	Y Hong Kong	Y Australia	Y UL or ETL	Y EAC	Y BSMI	
Y Mexico	Y Bulgaria	Y Taiwan		Y BC		Y CRS	
	Y Croatia	Y Japan					
	Y Denmark	Y Korea					
	Y Finland	Y Malaysia					
	Y France	Y Singapore					
	Y Germany	Y Thailand					
	Y Greece	Y Philippines					
	Y Hungary	Y India					
	Y Ireland	Y Indonesia					
	Y Italy						
	Y Luxembourg			Y WEEE	Y WEEE	Y Circle 10/E	
	Y Netherlands			Y US Recycle	Y US Recycle		
	Y Poland			Y House Logo	Y Triman House Logo	Y JP Paper Recycle	
	Y Portugal					Y JP Plastic Recycle	
	Y Romania					Y Taiwan Recycle	
	Y Russia					Y Korea Recycle	
	Y Spain					House Logo	
	Y Sweden					Y China RoHS Insert	
	Y Turkey						
	Y UK						

REFERENCE

62368 on WORM (Pocket Power): From Jay Tu (JUNE 02, 2017)

		@ Ambient (Room), Discharge Full Load, Full Capacity		@ 40C Ambient Elevated	@ 40C Ambient Elevated
		Vendor Test	RC Lab Test	RC Pre Test	RC Final Test
WORM 1 @ 24.4C	Sample 1	52.5C	53.9C	60.3C	61.0C
WORM 2 @24.4C	Sample 1	48.6C	49.9C	60.9C	54.6C
WORM 3 @ 26.8C	Average	48.4C	-	57.8, 58.5	-

62368 Summary

IEC-62368-1 June '19

Continuous Skin Touch >60sec

T_{max} = 48°C (25°C ambient)

T_{rise} = 23°C

Short Touch <60sec

T_{max} = 60°C (25°C ambient)

T_{rise} = 35°C

PGMXXXXX

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MPP103 Lightning Pocket Power

SKU Matrix

BASE	SKU	Base Description	Color	Channel	Cell Platform	EE Platform	ME Platform
1	SKU 1	MPP 103-1 (Soft Shell 5k Pocket Power LTG)	Space Gray	Apple Retail Stores	Single 5Ah	Platform A	Pending ID direction
	SKU 2	MPP 103-1 (Soft Shell 5k Pocket Power LTG)	Silver	Apple Retail Stores	Single 5Ah	Platform A	Pending ID direction
	SKU 3	MPP 103-1 (Soft Shell 5k Pocket Power LTG)	Gold	Apple Retail Stores	Single 5Ah	Platform A	Pending ID direction
	SKU 4	MPP 103-1 (Soft Shell 5k Pocket Power LTG)	Blue	Apple Retail Stores	Single 5Ah	Platform A	Pending ID direction
2	SKU 5	MPP 103-2 (Soft Shell 10k Pocket Power LTG)	Space Gray	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
	SKU 6	MPP 103-2 (Soft Shell 10k Pocket Power LTG)	Silver	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
	SKU 7	MPP 103-2 (Soft Shell 10k Pocket Power LTG)	Gold	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
	SKU 8	MPP 103-2 (Soft Shell 10k Pocket Power LTG)	Blue	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
3	SKU 9	MPP 103-3 (Soft Shell 10k Pocket Power LTG) w/ CBL MNGT	Space Gray	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
	SKU 10	MPP 103-3 (Soft Shell 10k Pocket Power LTG) w/ CBL MNGT	Silver	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
	SKU 11	MPP 103-3 (Soft Shell 10k Pocket Power LTG) w/ CBL MNGT	Gold	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
	SKU 12	MPP 103-3 (Soft Shell 10k Pocket Power LTG) w/ CBL MNGT	Blue	Apple Retail Stores	Dual 5Ah	Platform B	Pending ID direction
4	SKU 13	MPP 103-1 (Hard Shell 5k Pocket Power LTG)	Black	Worldwide	Single 5Ah	Platform A	Pending ID direction
	SKU 14	MPP 103-1 (Hard Shell 5k Pocket Power LTG)	Gold (Apple)	Worldwide	Single 5Ah	Platform A	Pending ID direction
5	SKU 15	MPP 103-2 (Hard Shell 10k Pocket Power LTG)	Black	Worldwide	Dual 5Ah	Platform B	Pending ID direction
	SKU 16	MPP 103-2 (Hard Shell 10k Pocket Power LTG)	Gold (Apple)	Worldwide	Dual 5Ah	Platform B	Pending ID direction
6		MPP 104-1 (15k)	TBD	Apple Retail Stores	TBD	TBD via PVP	Pending ID direction
7		MPP 104-2 (20k)	TBD	Apple Retail Stores	TBD	TBD via PVP	Pending ID direction
EE Platform	A	Input: 12W Lightning Female, Output: Single 12W USB-A	Pass-thru Priority Charging		MFI Approved		
EE Platform	B	Input: 12W Lightning Female, Output: 5W USB-A, 12W USB-A	Pass-thru Priority Charging		MFI Approved		
Cell Platform	Single 5Ah	Enter cell description and model # here.					
Cell Platform	Dual 5Ah	Enter cell description and model # here.					

Belkin Power Bank Spec

MP103-2/3 10,000mAH

1 CELL Data			Result
1.1	Cell Type	Lithium Polymer 5000mAH	
1.2	Cell Certification	Yes	
1.3	Typical Capacity	3.7V/5100mAH @0.2Cmin Discharge	
1.3	Minimum Capacity	3.7V/500mAH @0.2Cmin Discharge	
1.4	Temperature Range	Charge 0-45°C. Discharge -20-60°C	
1.5	Cell Protection	Yes	
1.6	Battery Charge Terminate Voltage	4.35V	
1.7	Battery Over Discharge Protection	3V	
1.8	Battery Thermal Protection	Have.	
2 DC Input Testing			Result
2.1	Input Voltage	4.7V ~ 5.5V	
2.2	Input Voltage Protection	N/A	
2.2	Input Current	Max 2.4 A	
2.3	Fuse Protection	N/A	
2.4	Input Connector	Lighting Receptacle	
3 DC Output Testing			Result
3.1	DC Output Voltage	4.97V -5.25V	
3.2	DC Output Current	Max 2.4A	
3.3	Ripple & Noise level	Max 100mVpp with 20Mhz Band Width	
3.4	Short Circuit Protection	Yes	
3.5	Over Current Protection	Limit at 2.6A -2.9A	
3.6	Thermal Shutdown	Yes	
3.7	USB D+/D-	Auto detect	
3.8	Switching Frequency		
3.9	Efficiency	≥ 80%	
3.10	DC Output Connector	Two USB2.0-A connectors	

CONFIDENTIAL

BELKIN_000254

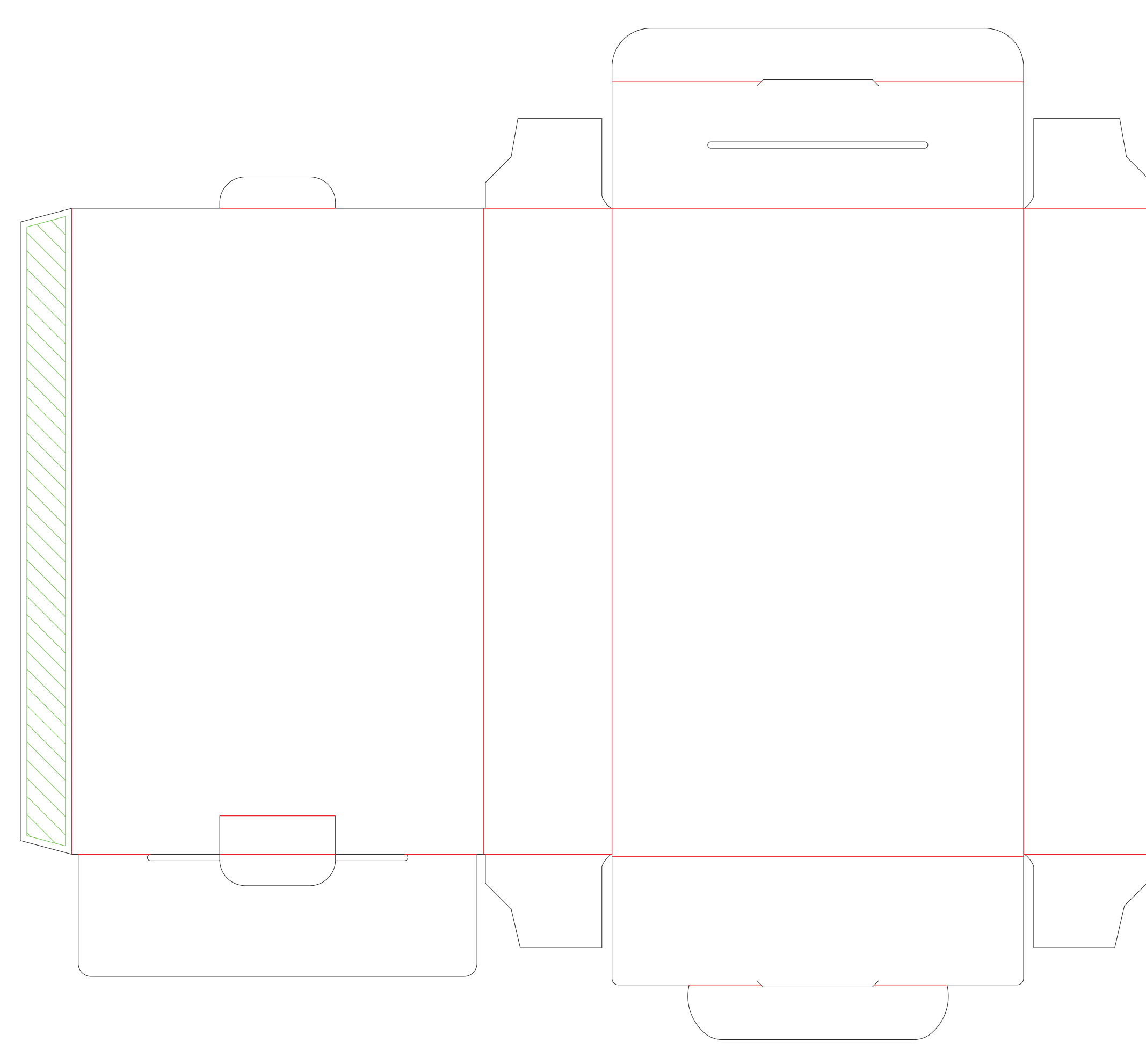
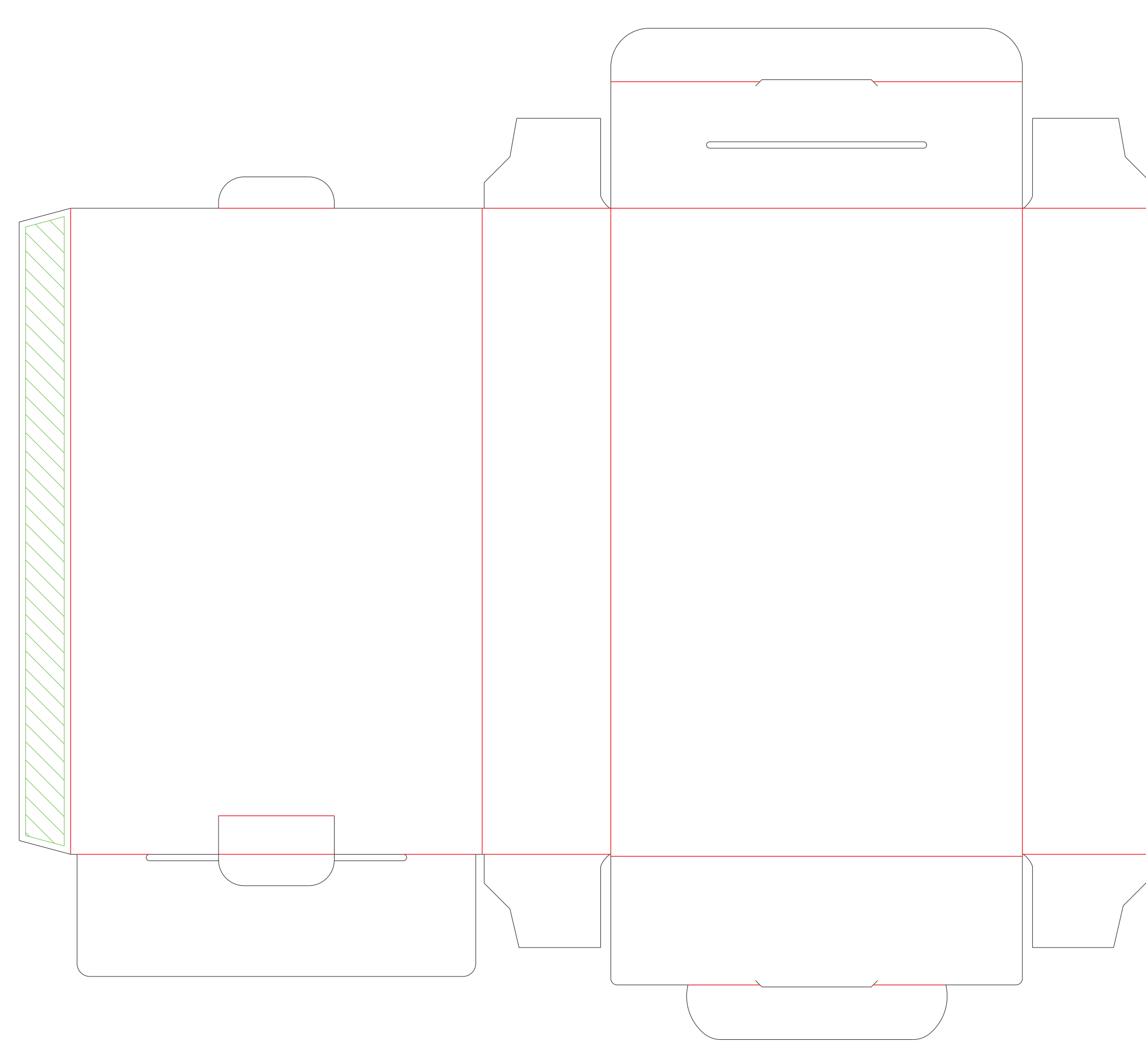
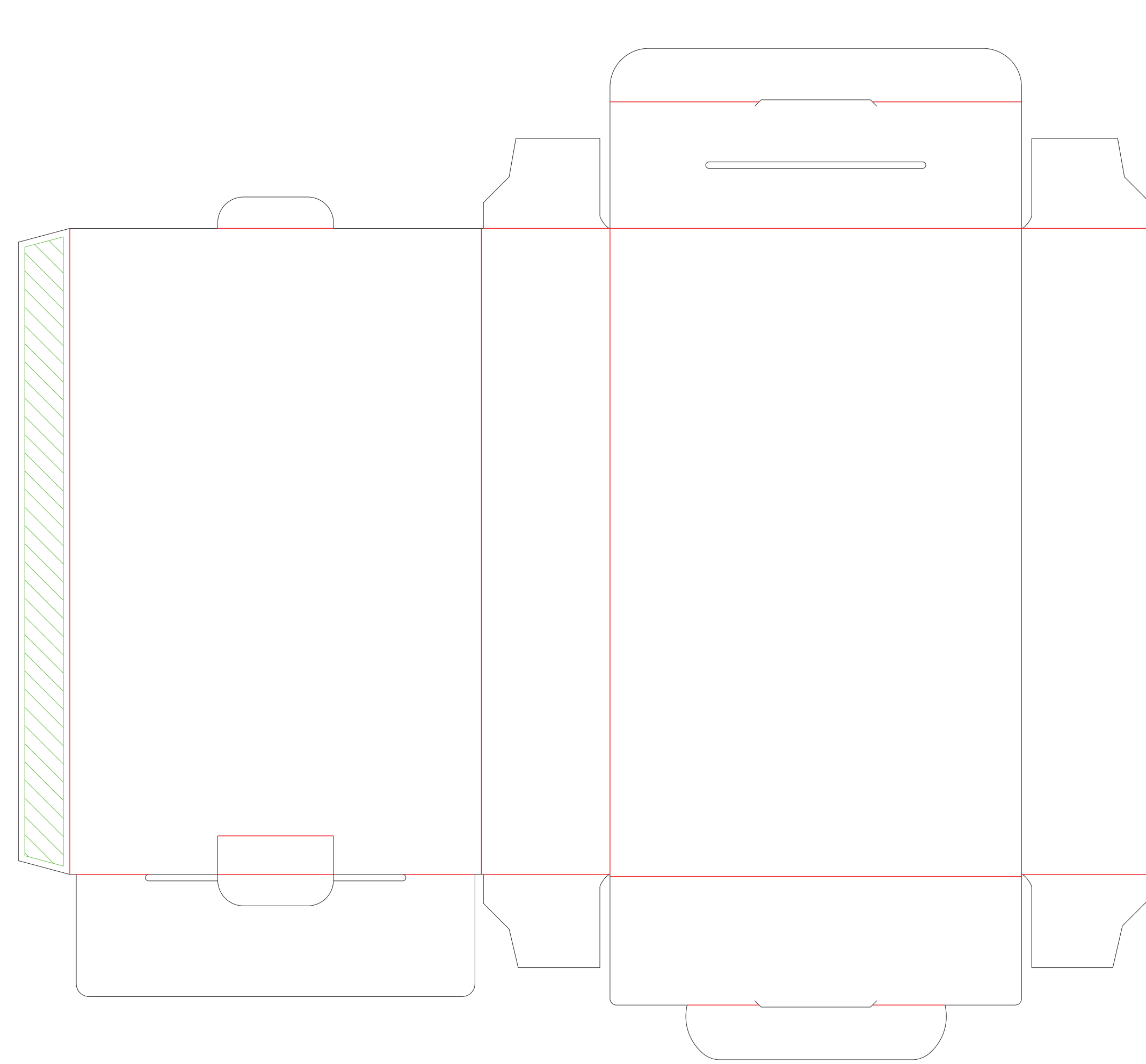
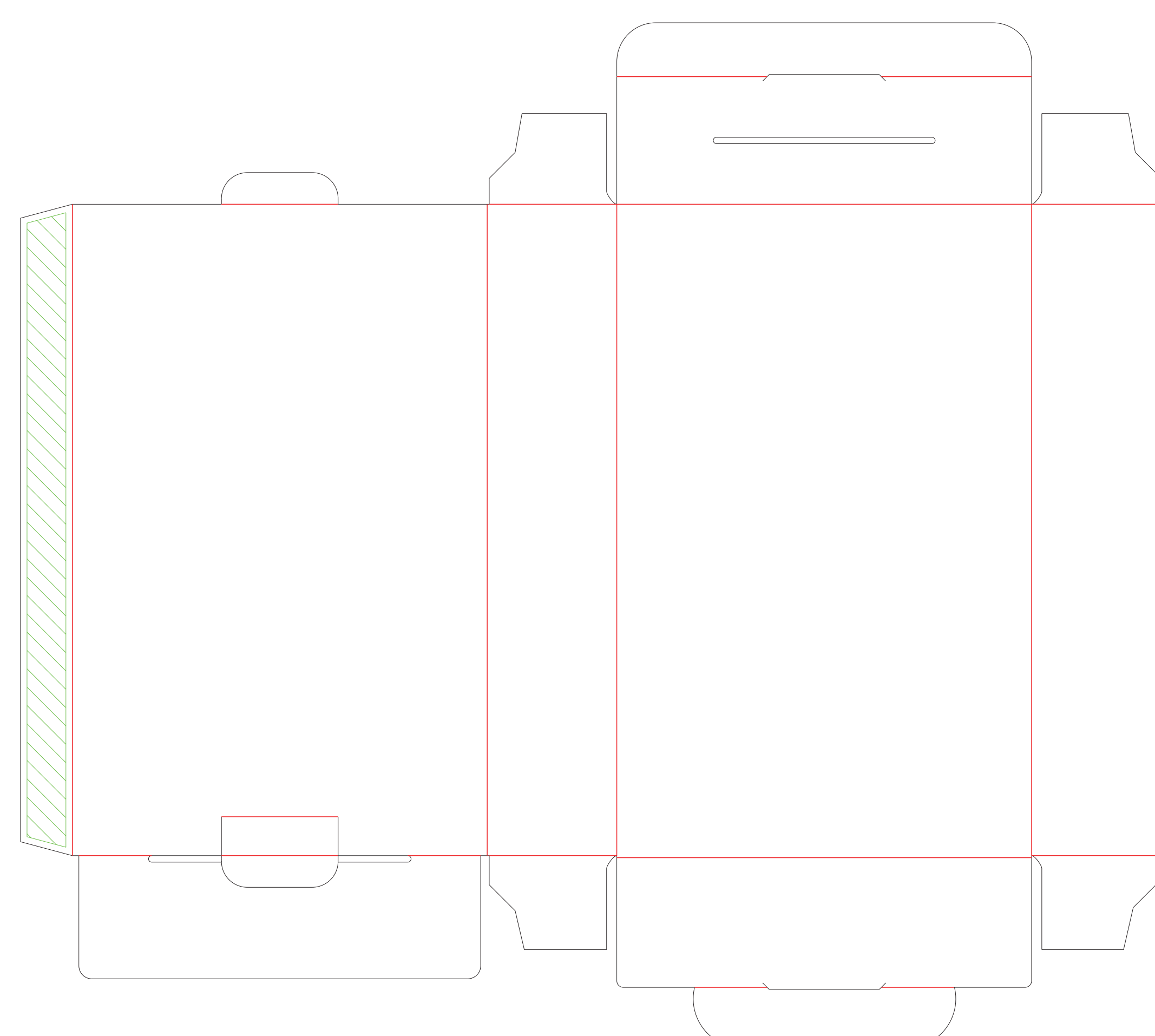
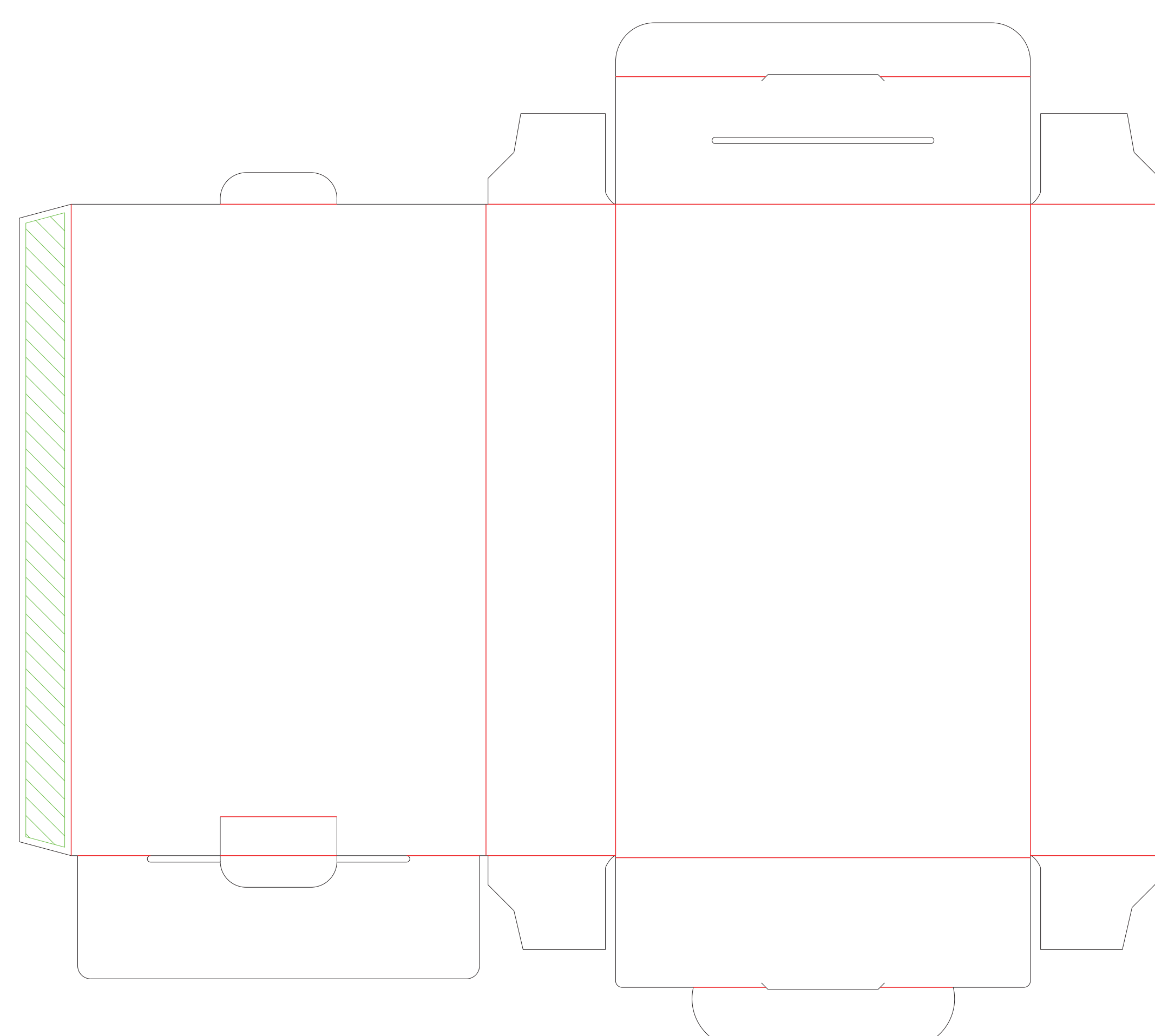
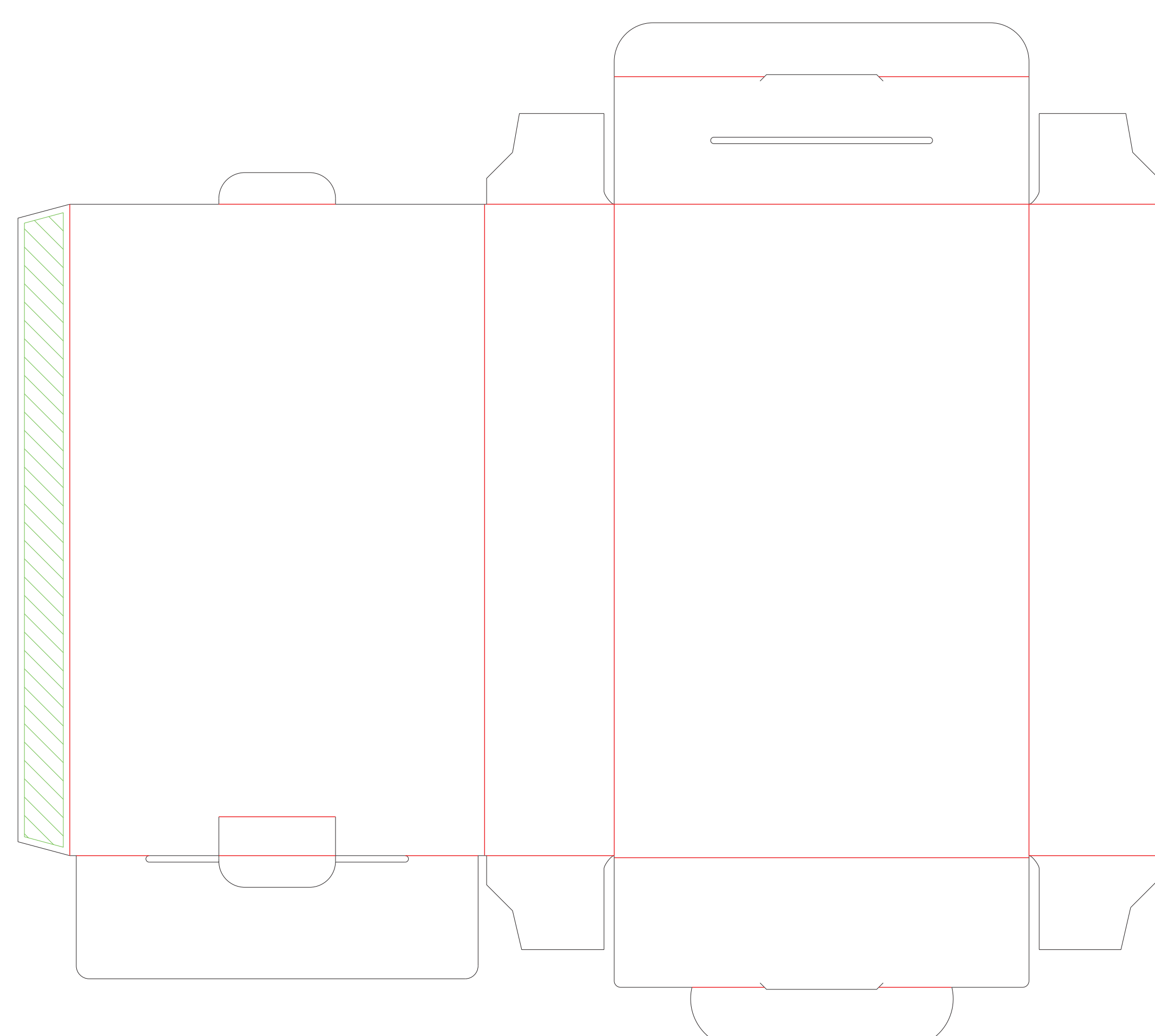
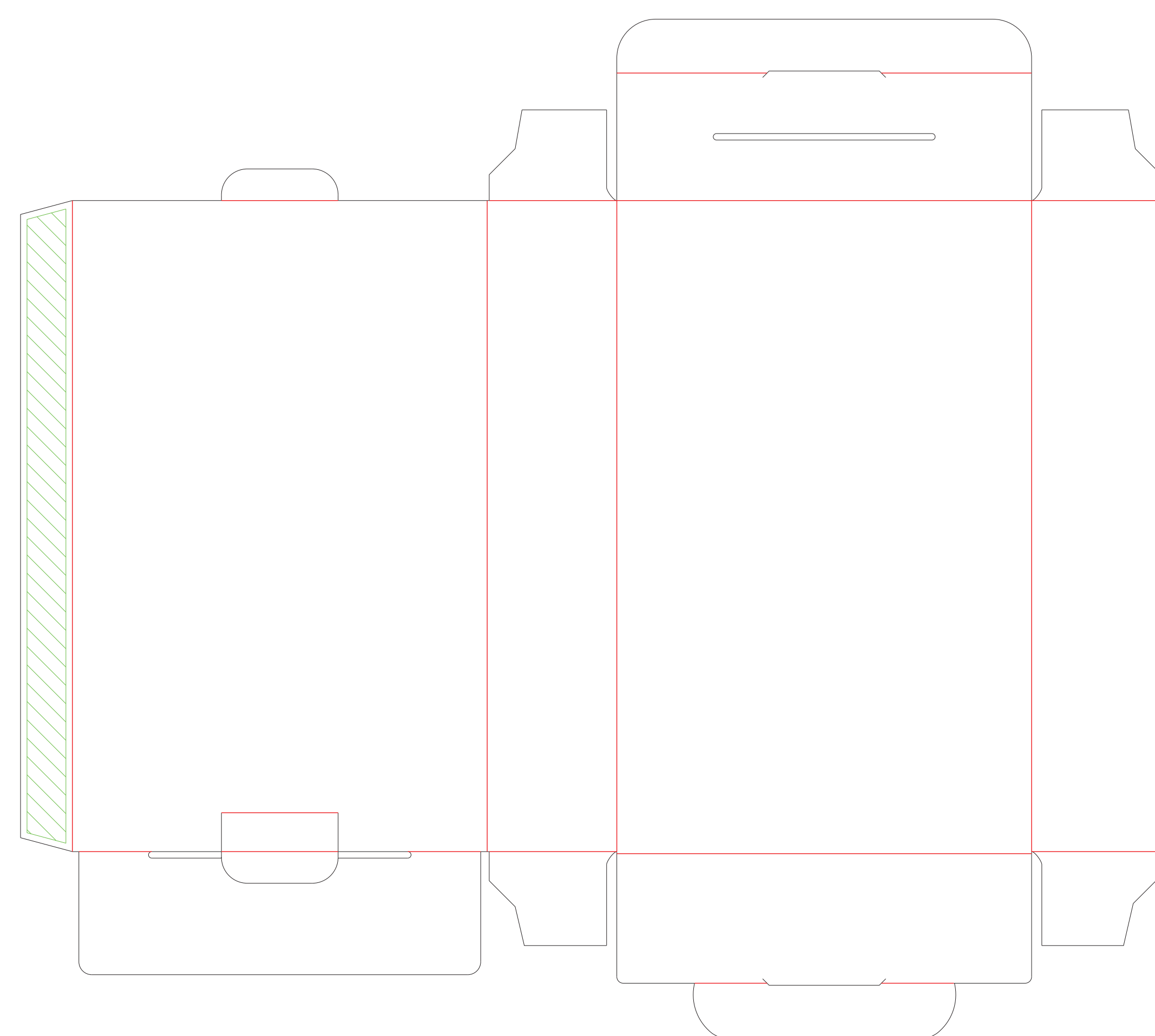
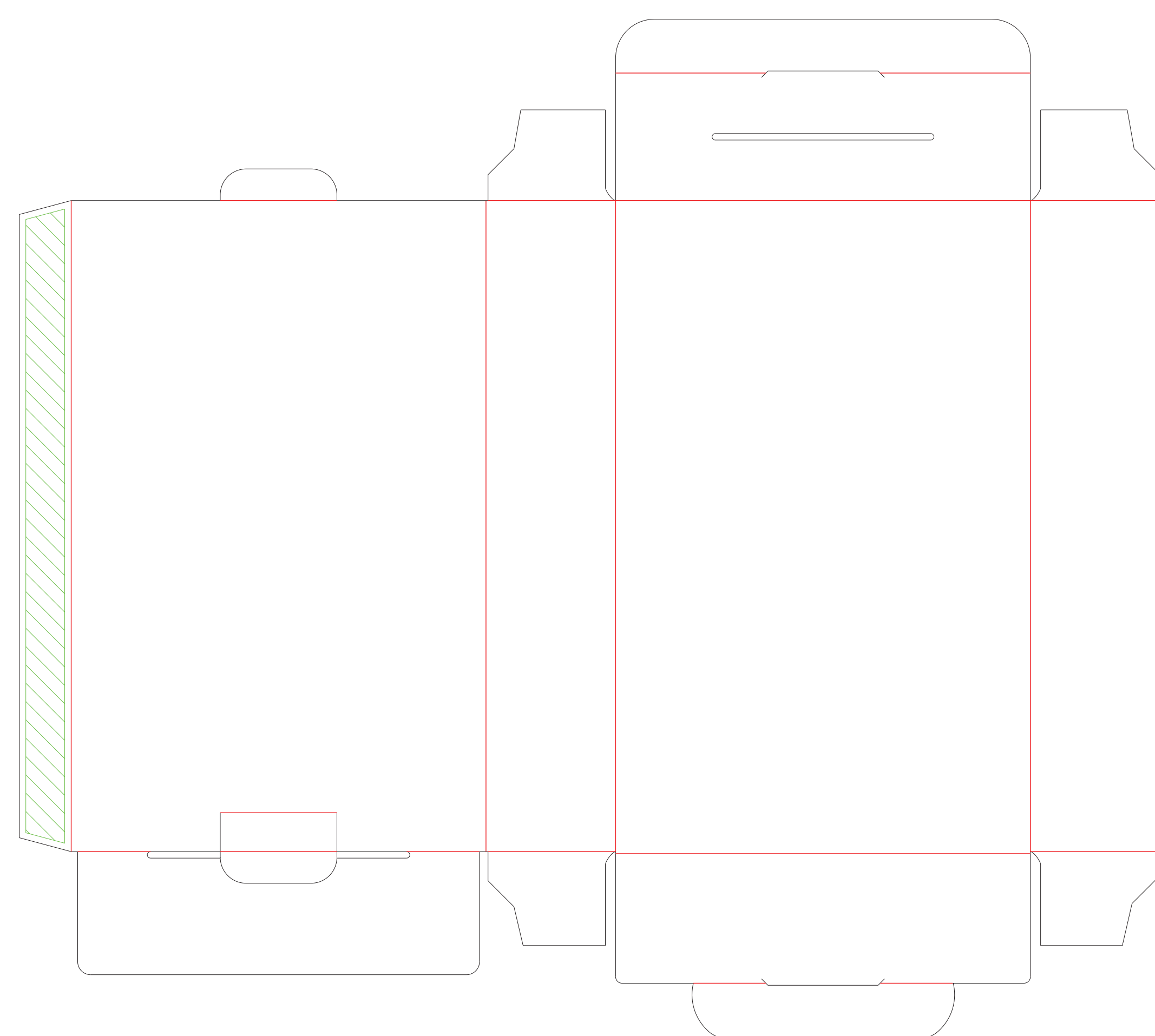
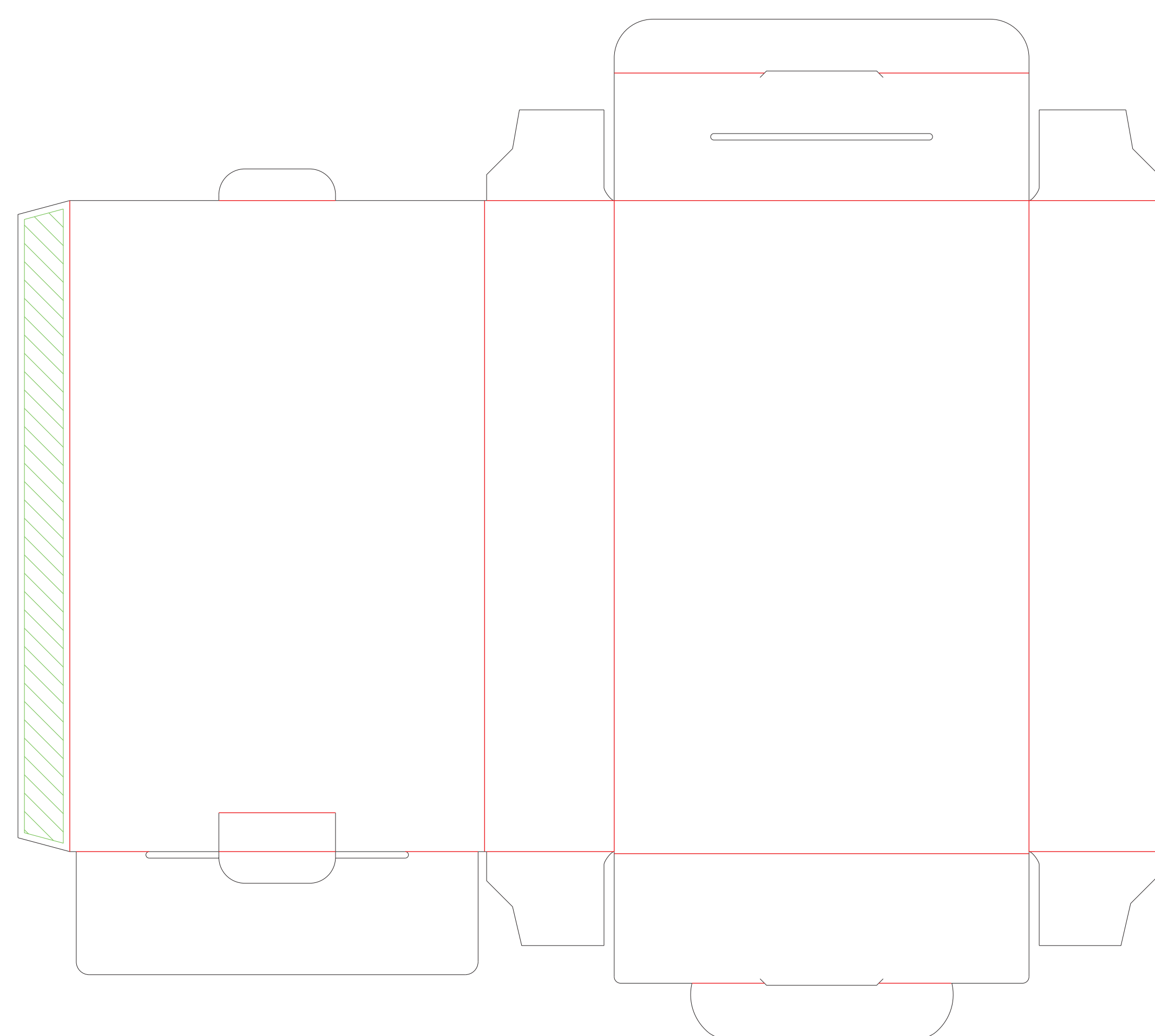
4 LED Light Requirement			Result
4.1	LED Color	Green	
4.2	LED Counts	4 Leds for battery level: 0% ~ 25% ~ 50% ~ 100%	
4.3	Charging Indication	Blink when battery is in charging mode.	
4.4	Discharging indication	Turn off after 5 second when battery is in discharging mode	

5 Button Function Testing			Result
5.1	System Power ON/OFF	When pressed, the system will turn on. When pressed and hold 2 seconds, the system will be off.	
5.2	Battery Life Indication	When pressed, the battery level is indicated for 5 seconds.	

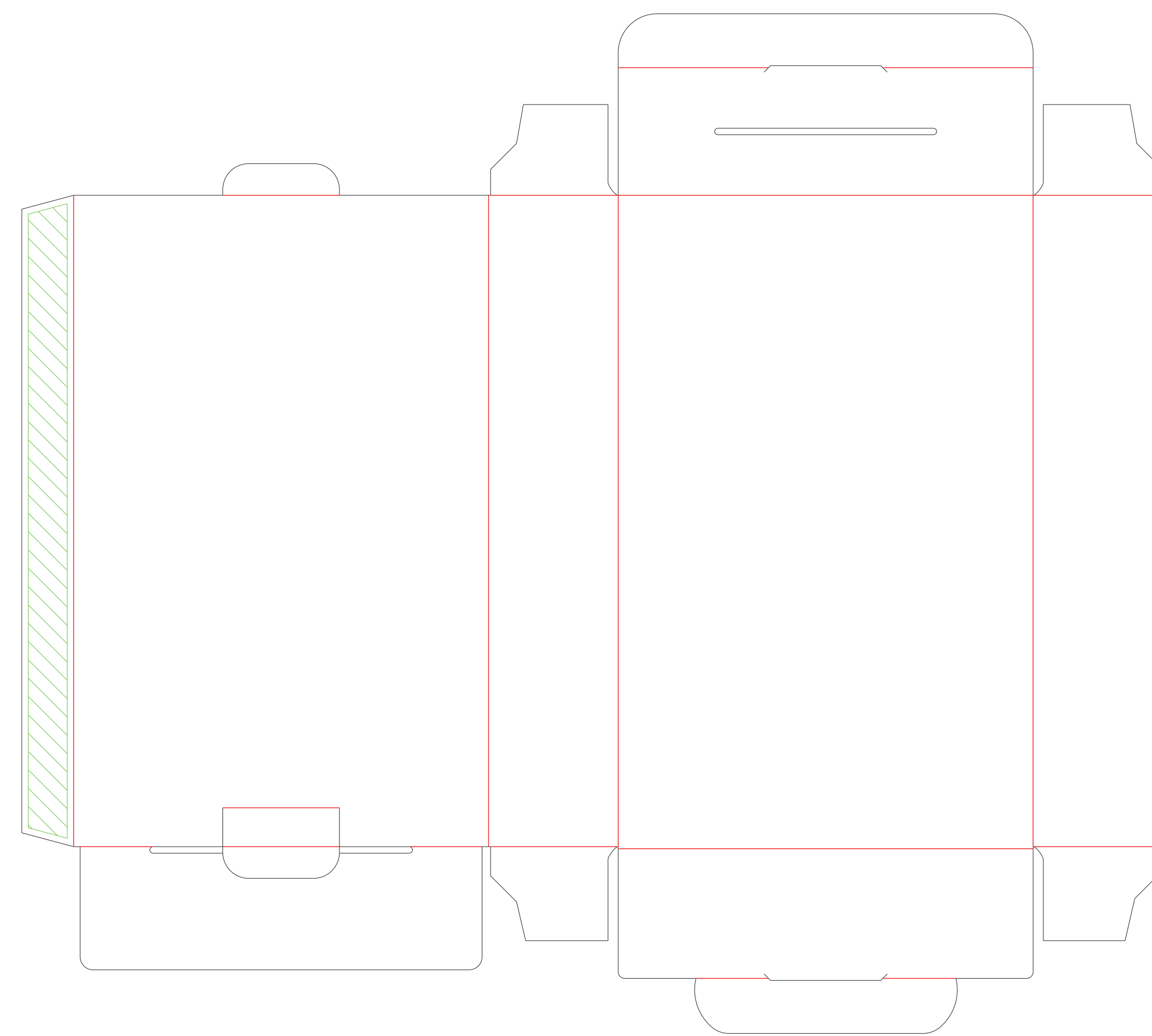
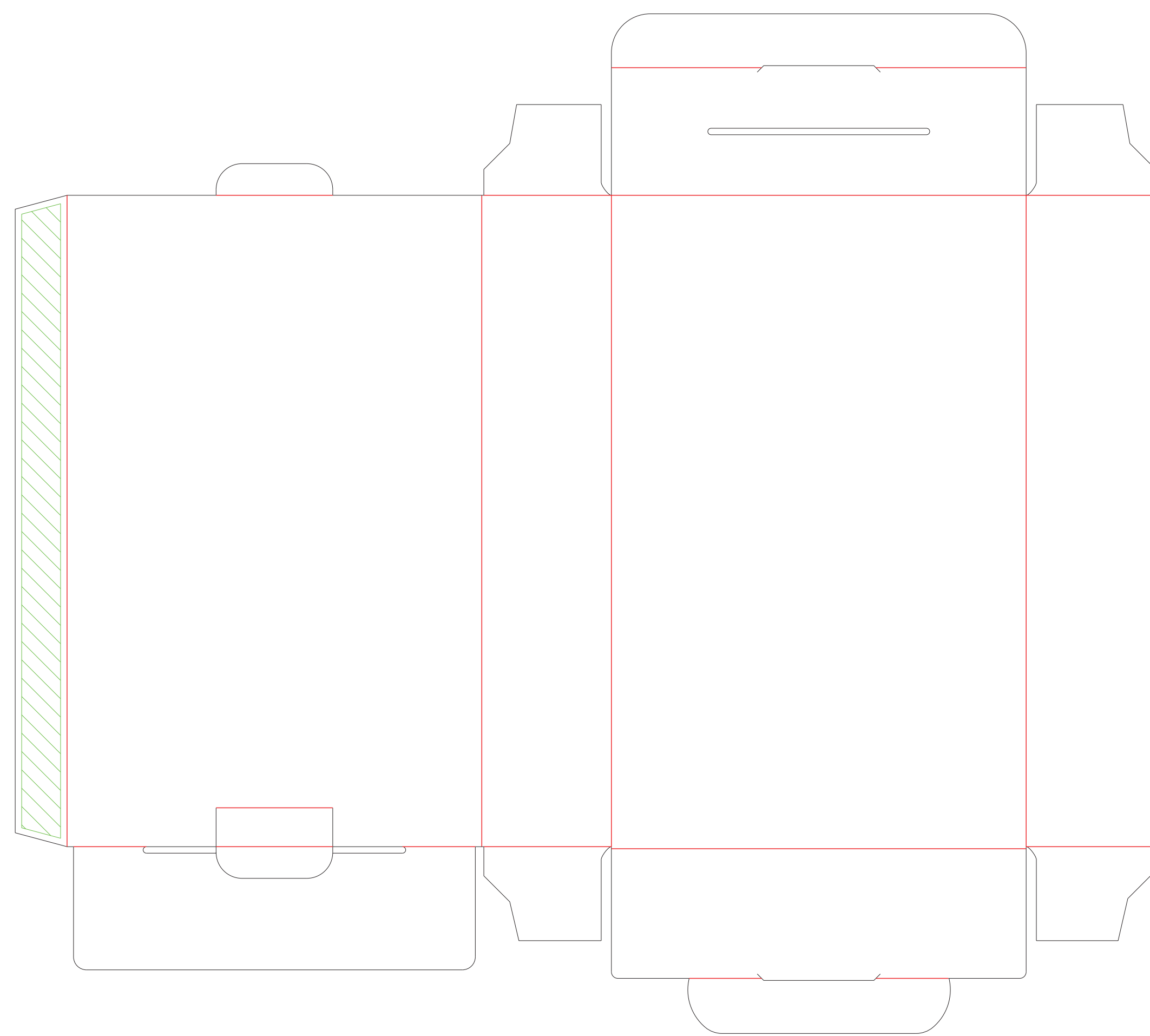
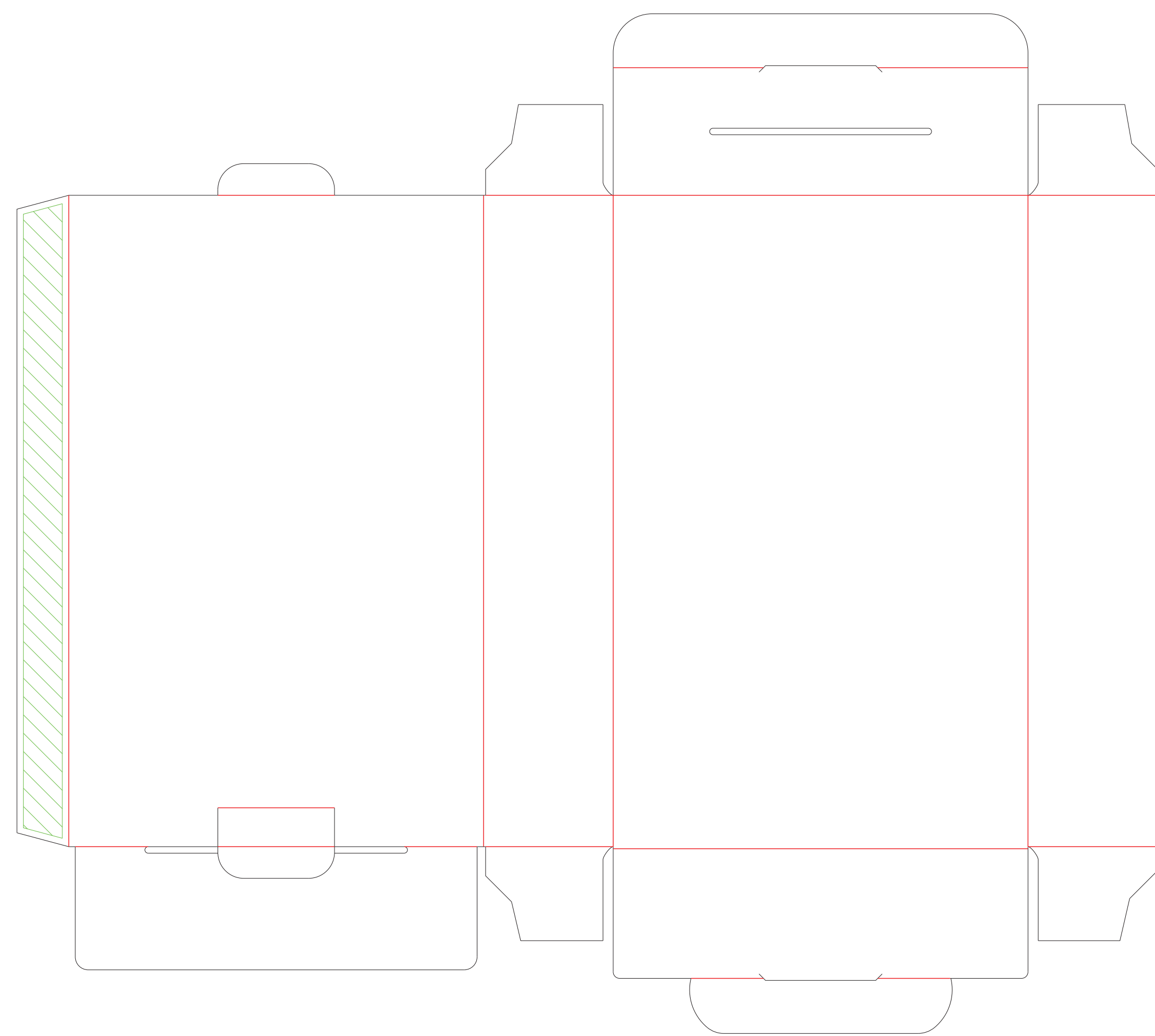
6 System Requirents			Result
6.1	Idle Current	<130uA	
6.2	Charging Pass through	Not decided yet	
6.3	Certification	FCC EMC	
6.4	Environmental Compliance	RoHS Prep65	
6.5	MFI License	Yes	

7 Burn-In Testing			Result
7.1	Burn-In Test	Charge at maximum current. Discharge maximum load.	

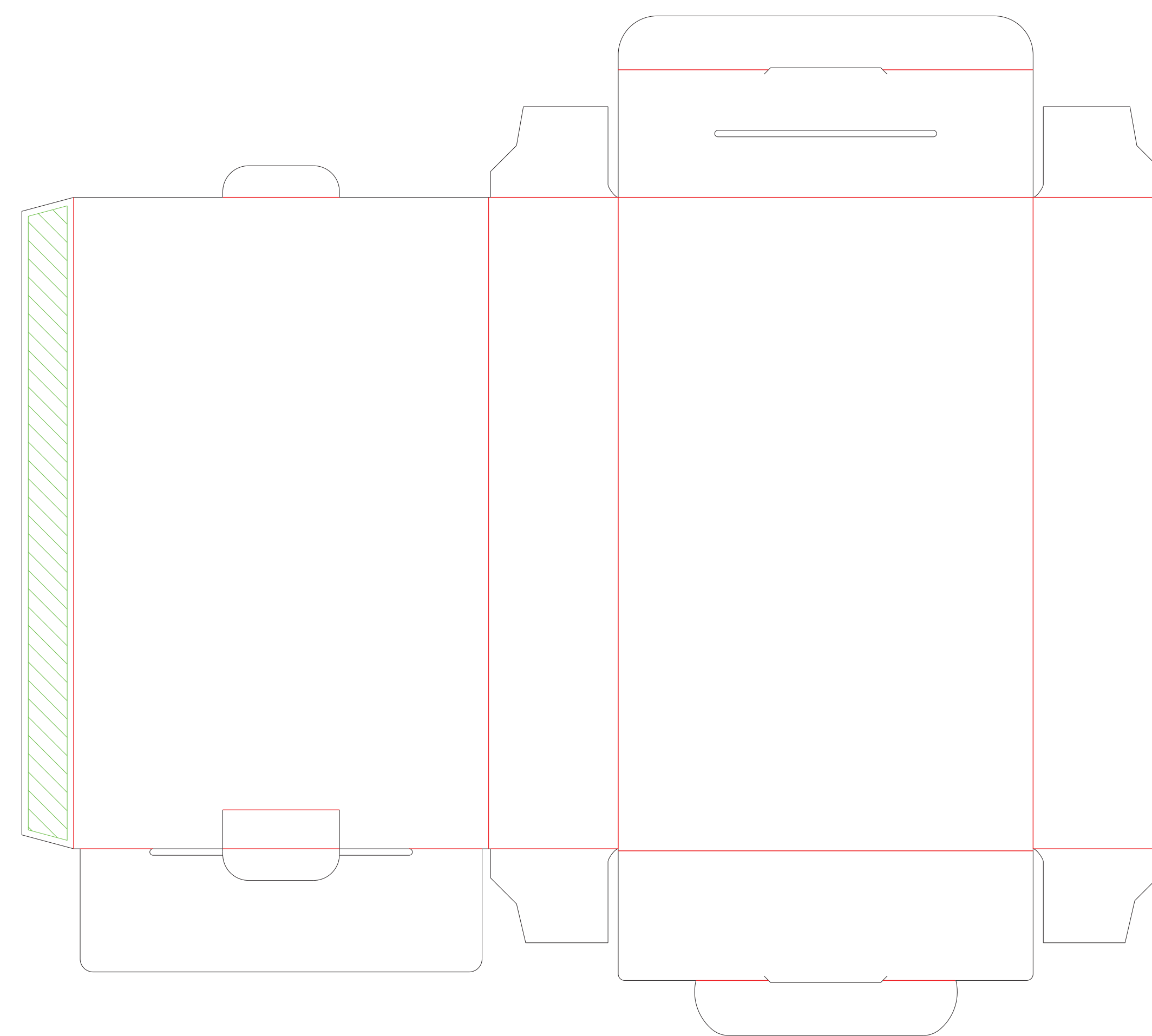
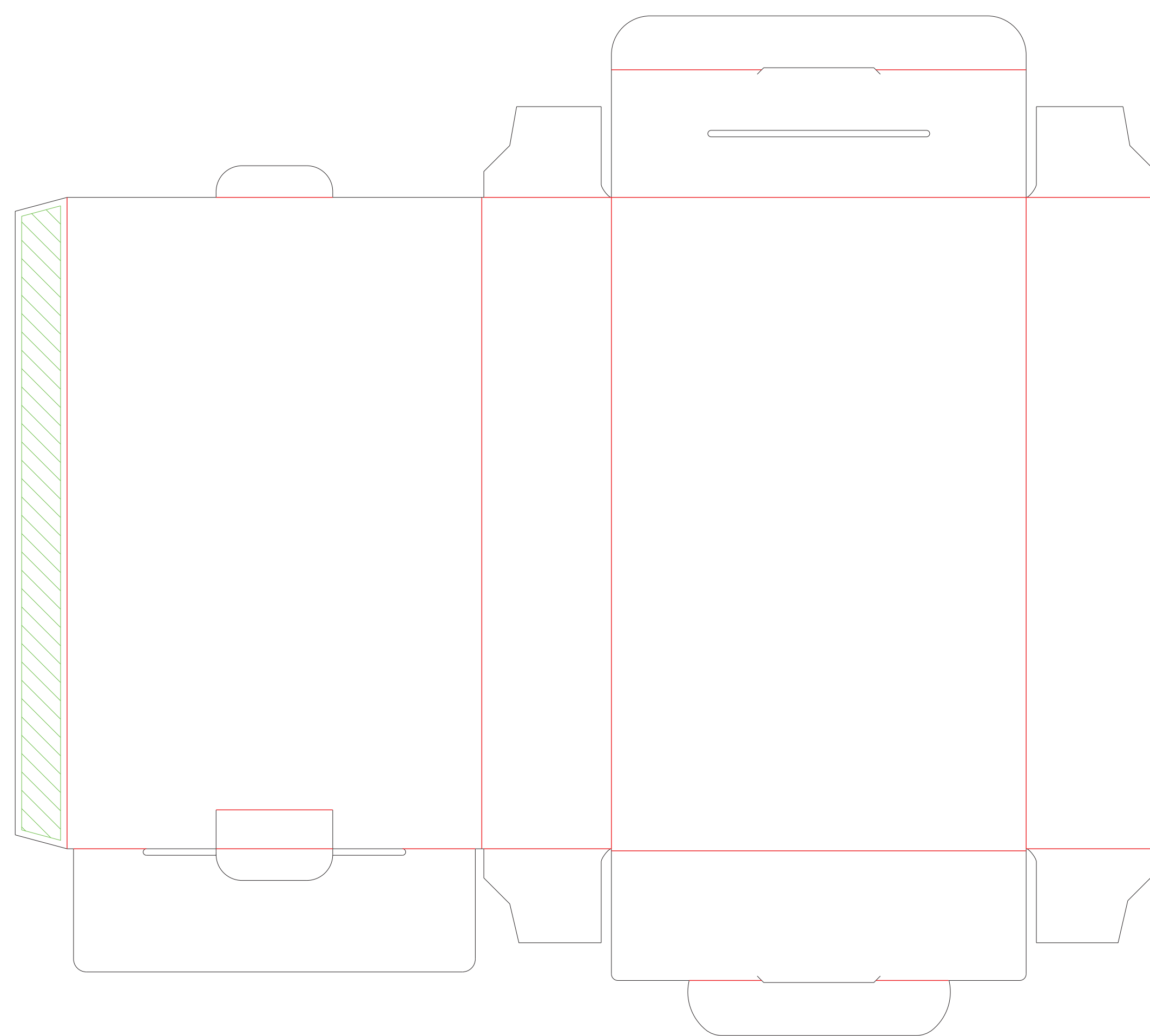
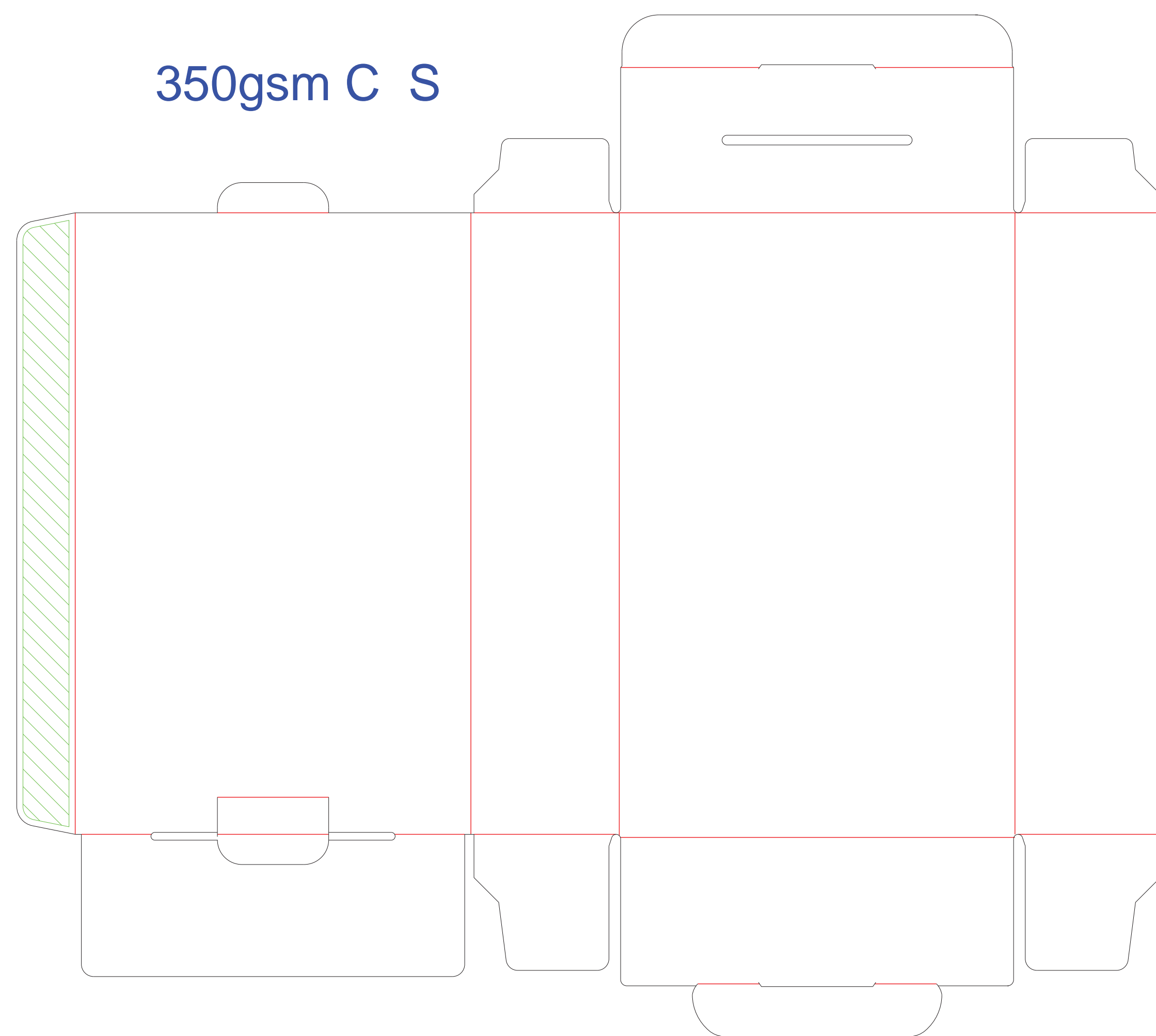
**PAGES BELKIN-256 TO BELKIN-329 ARE REDACTED
BECAUSE THEY CONTAIN PERSONAL INFORMATION
RELATING TO BELKIN CUSTOMERS.**



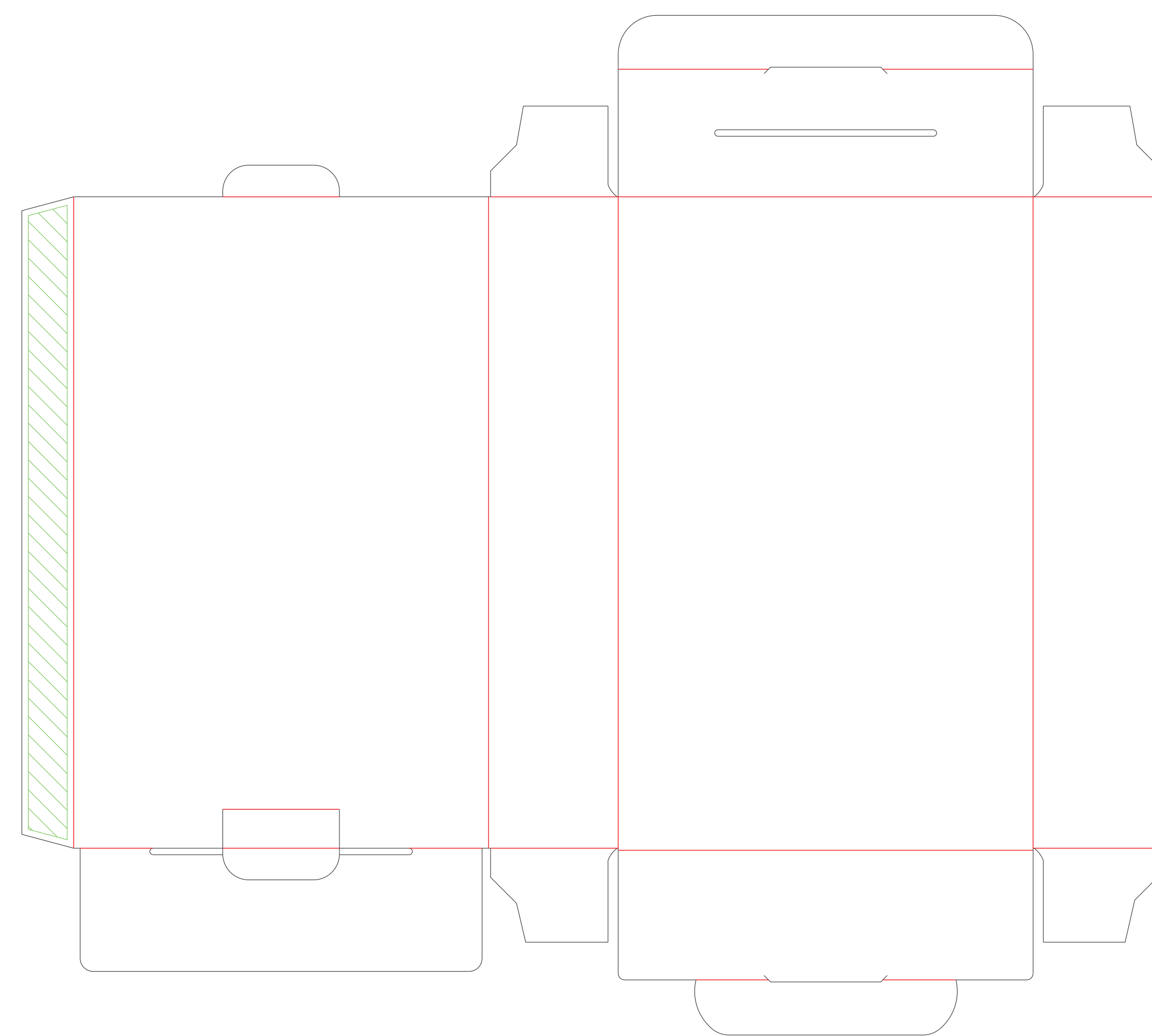
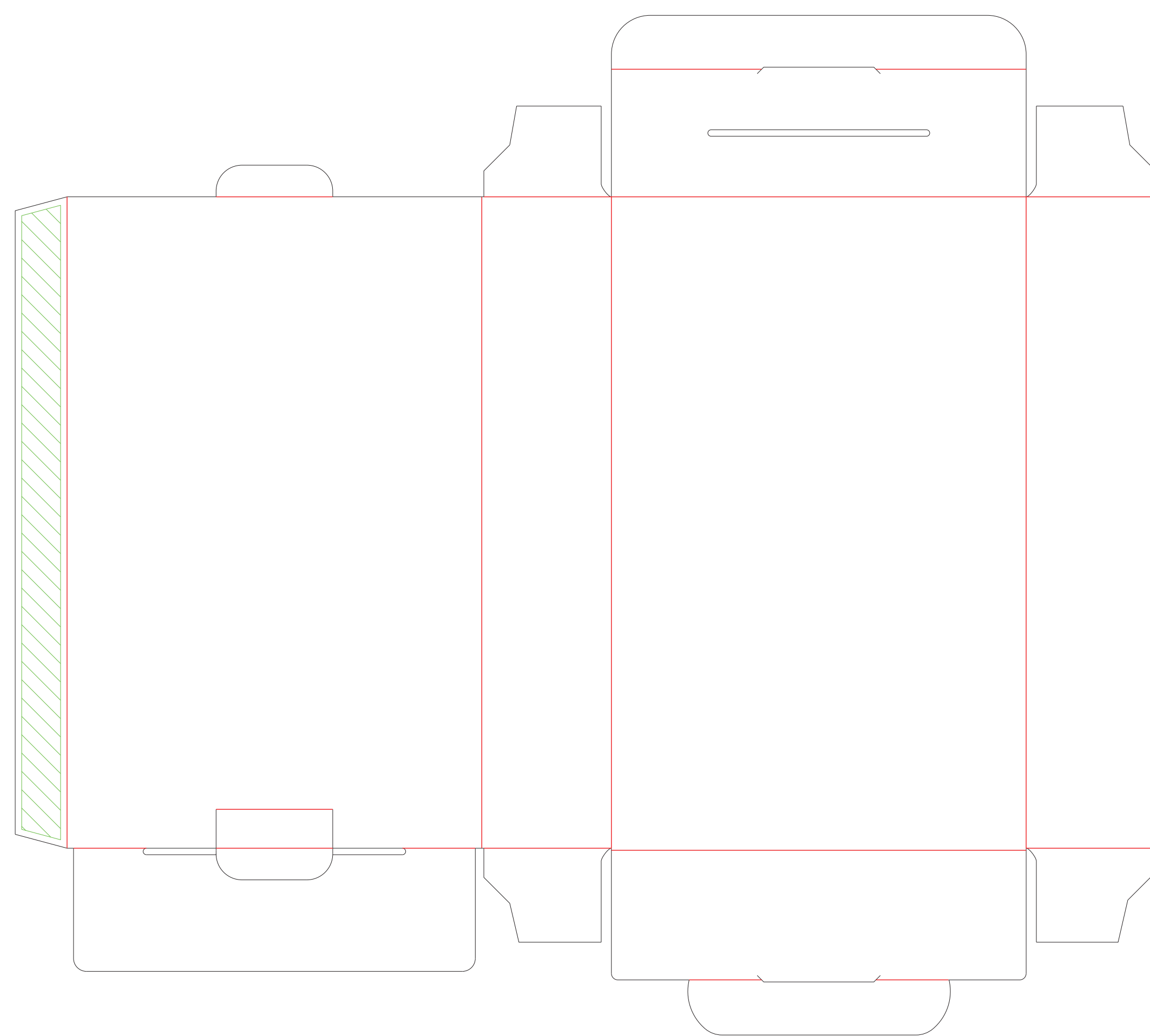
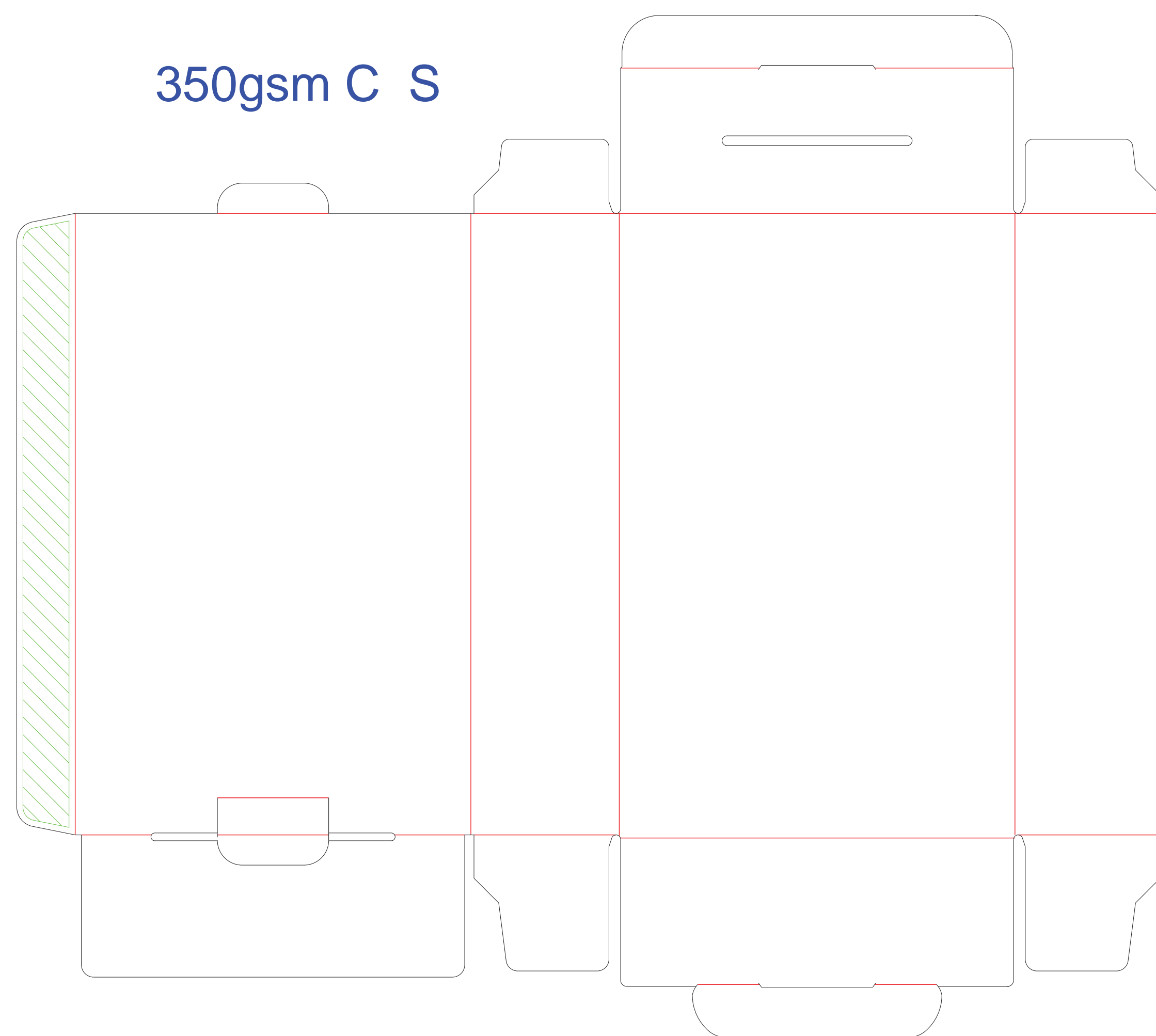


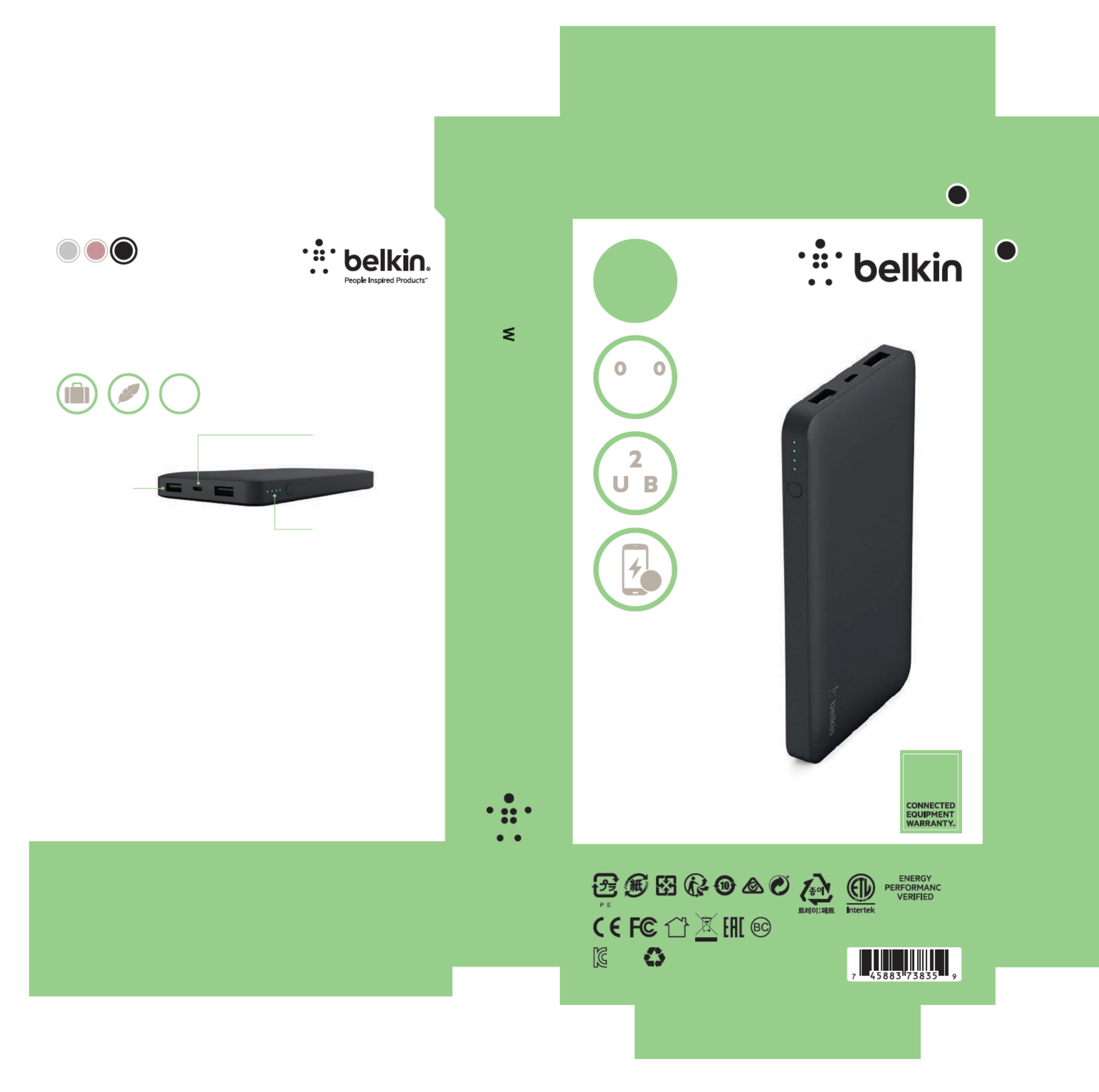
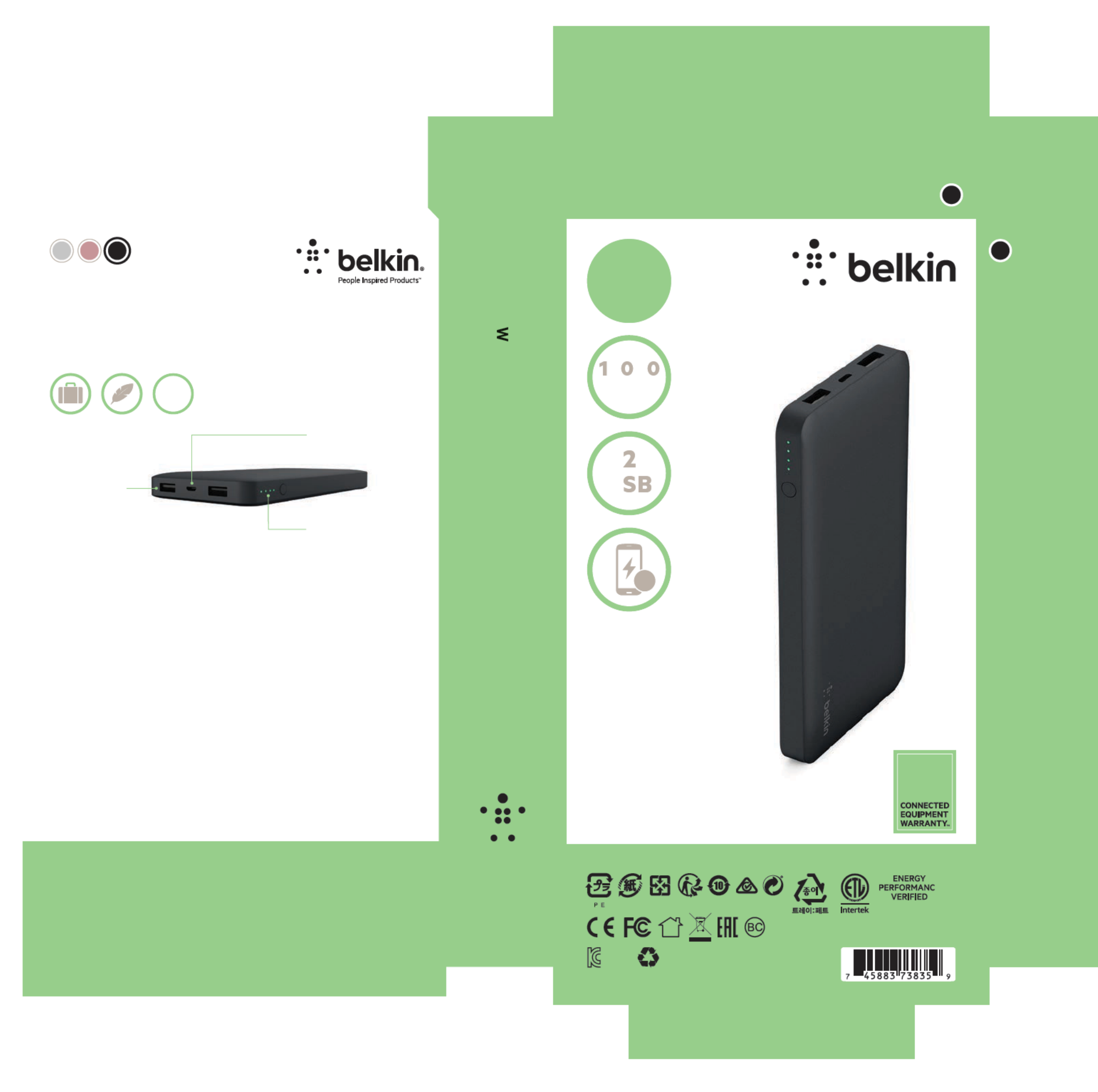
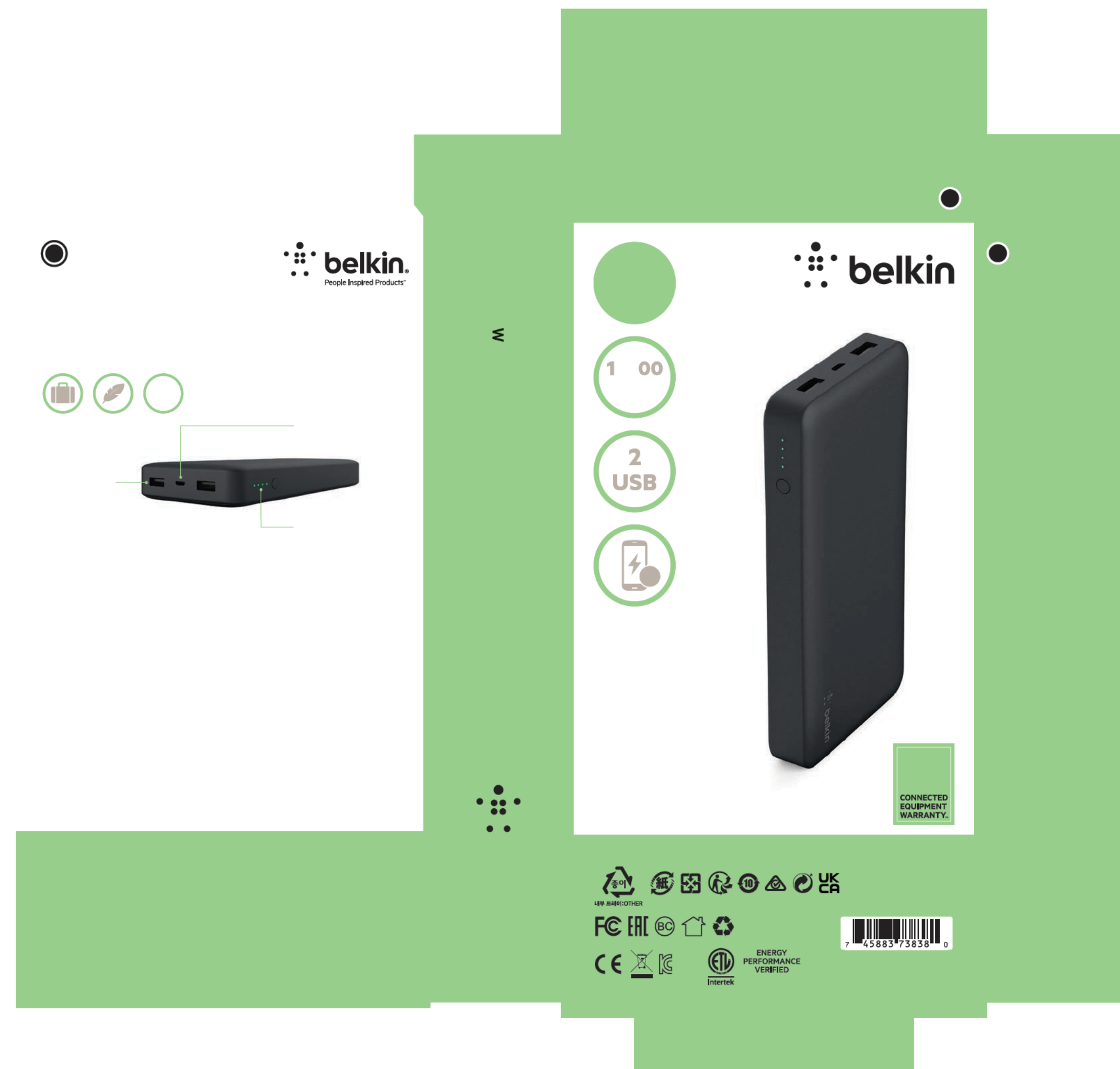
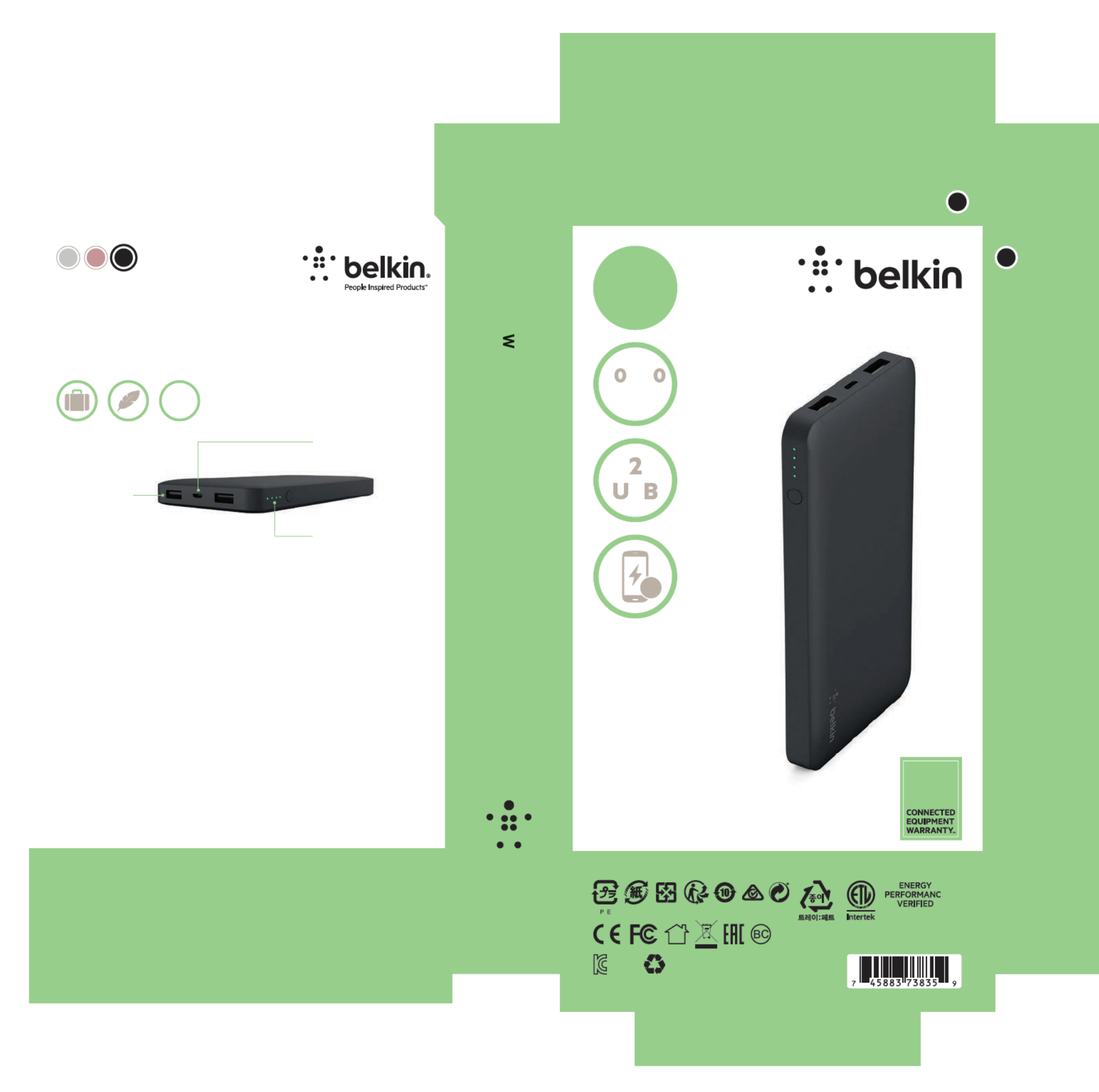
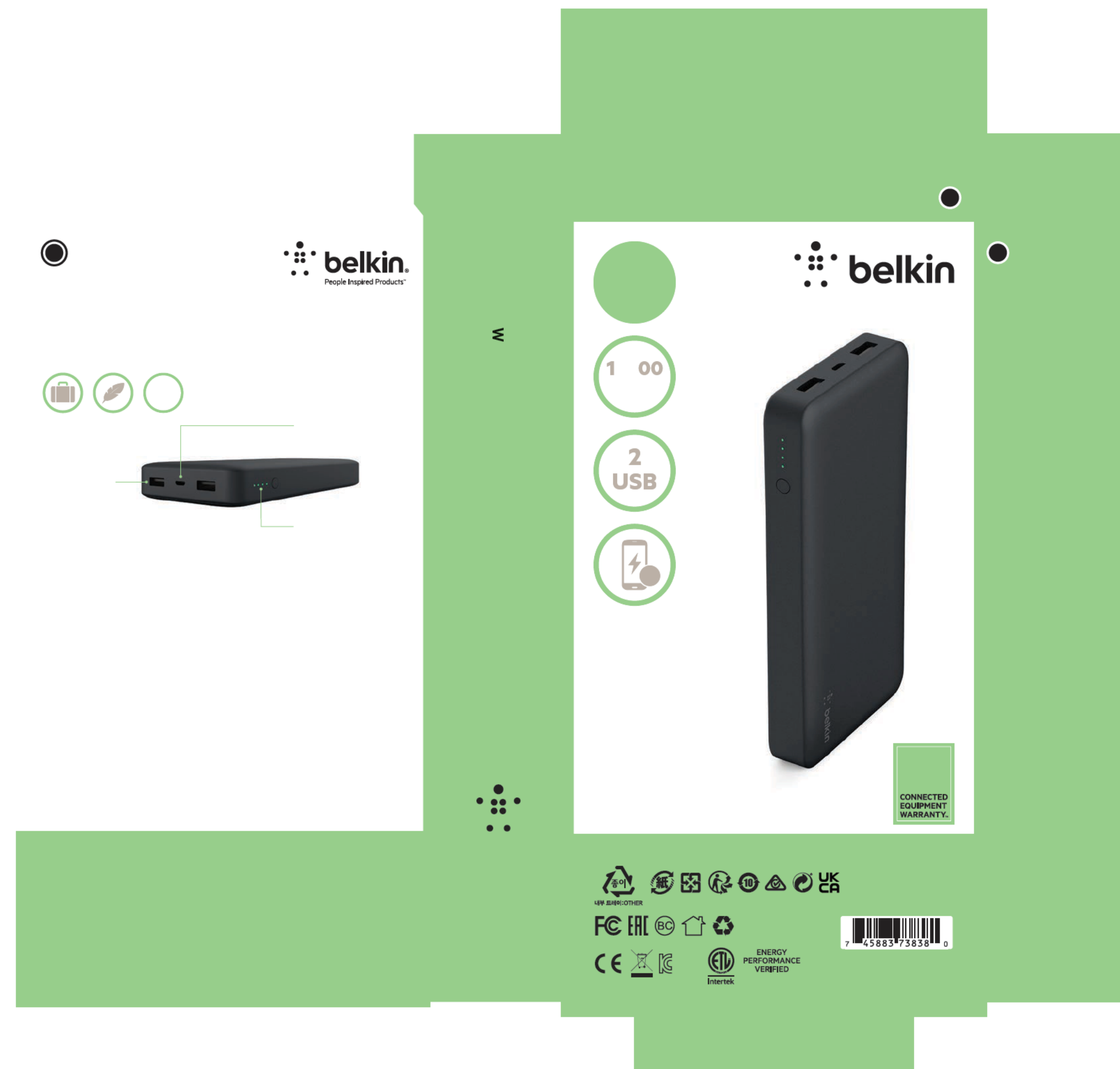


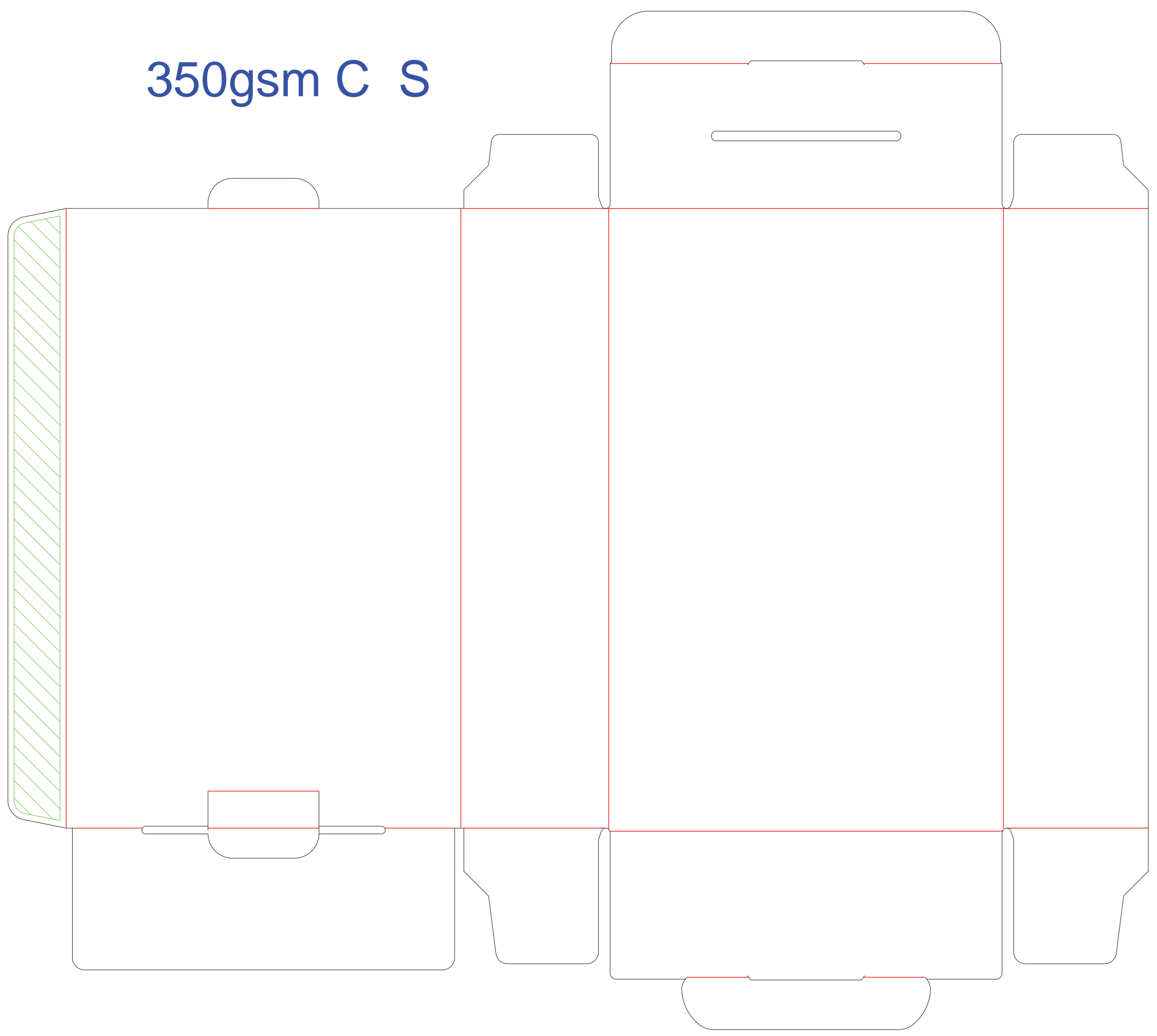
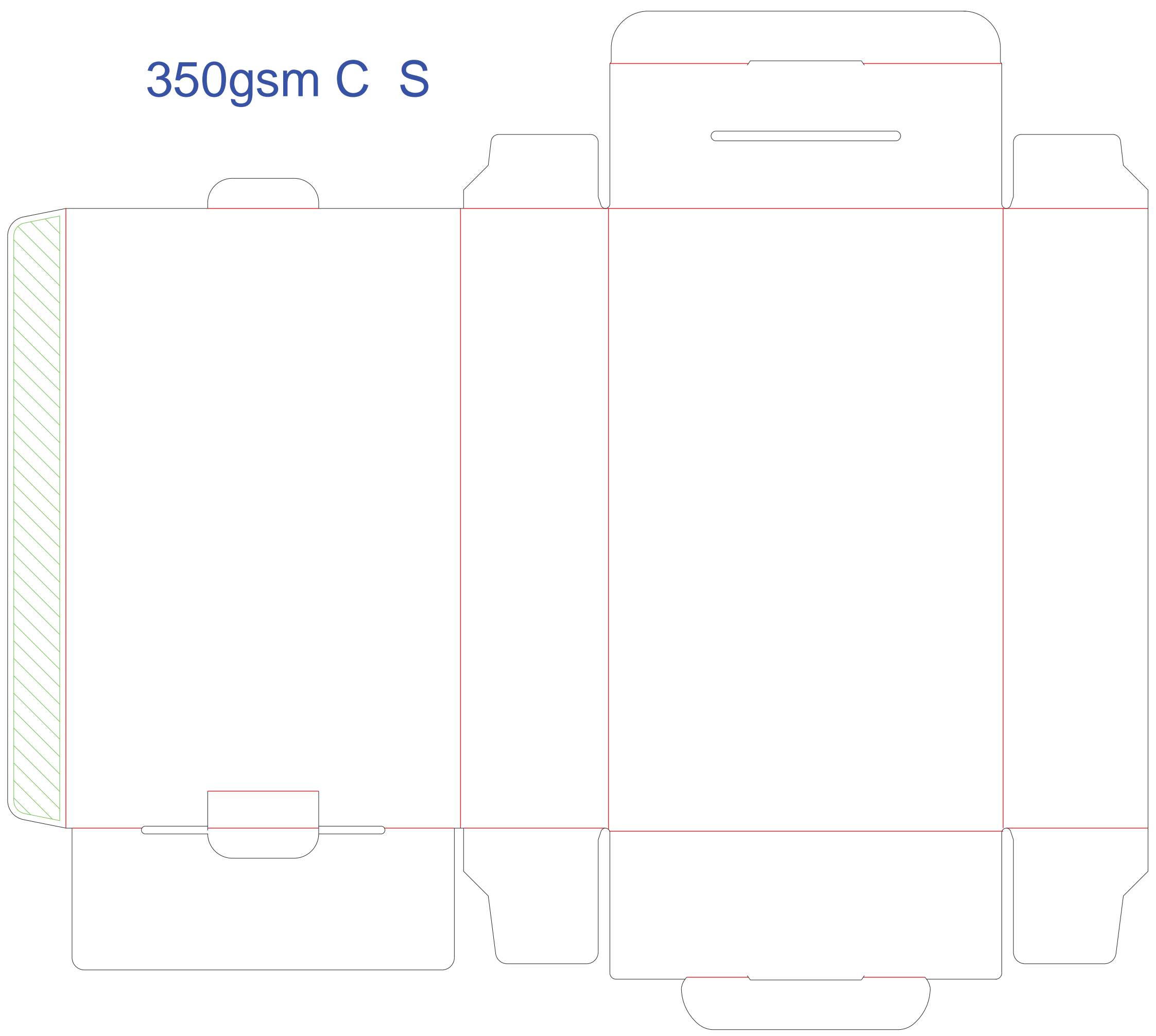
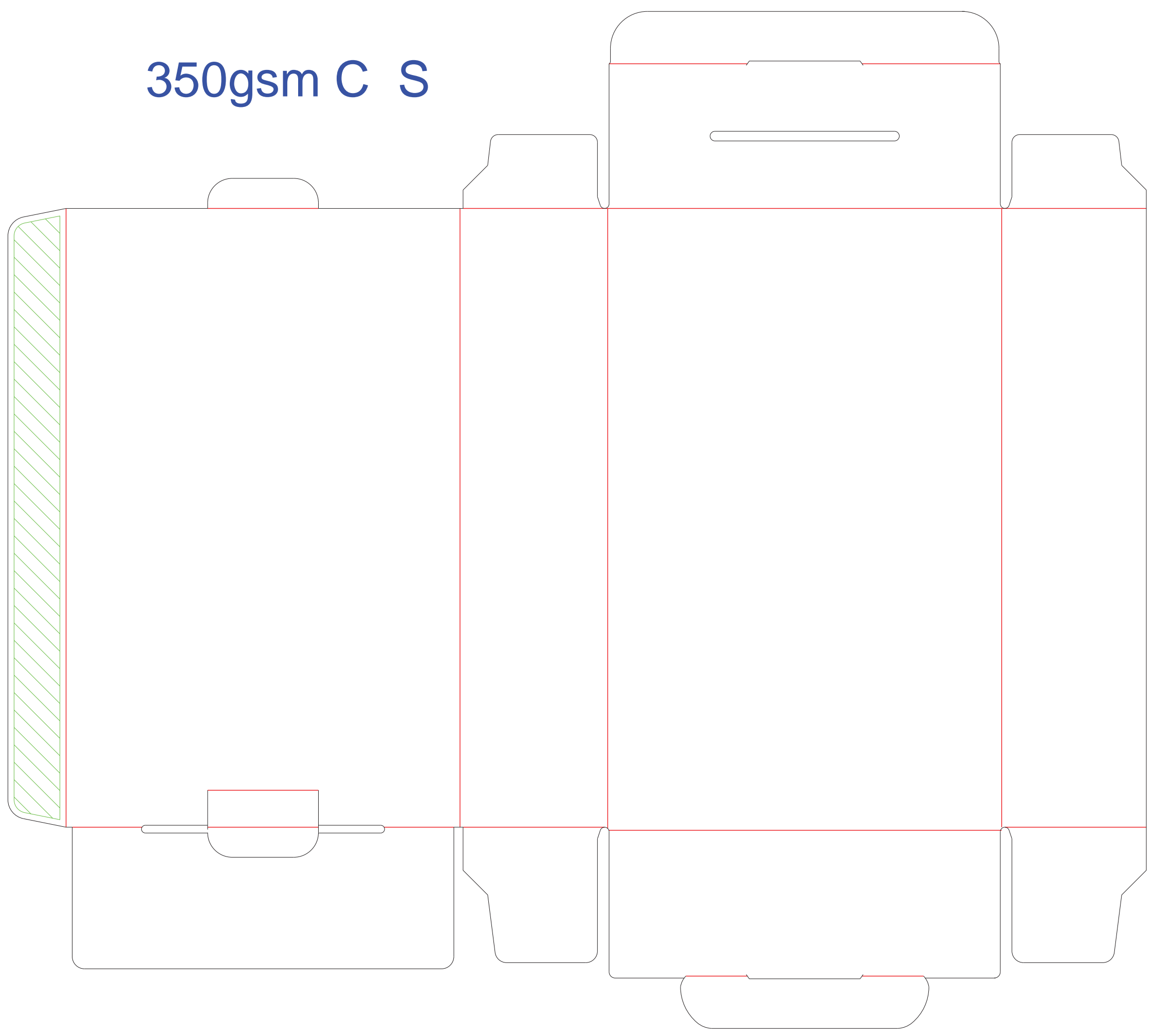
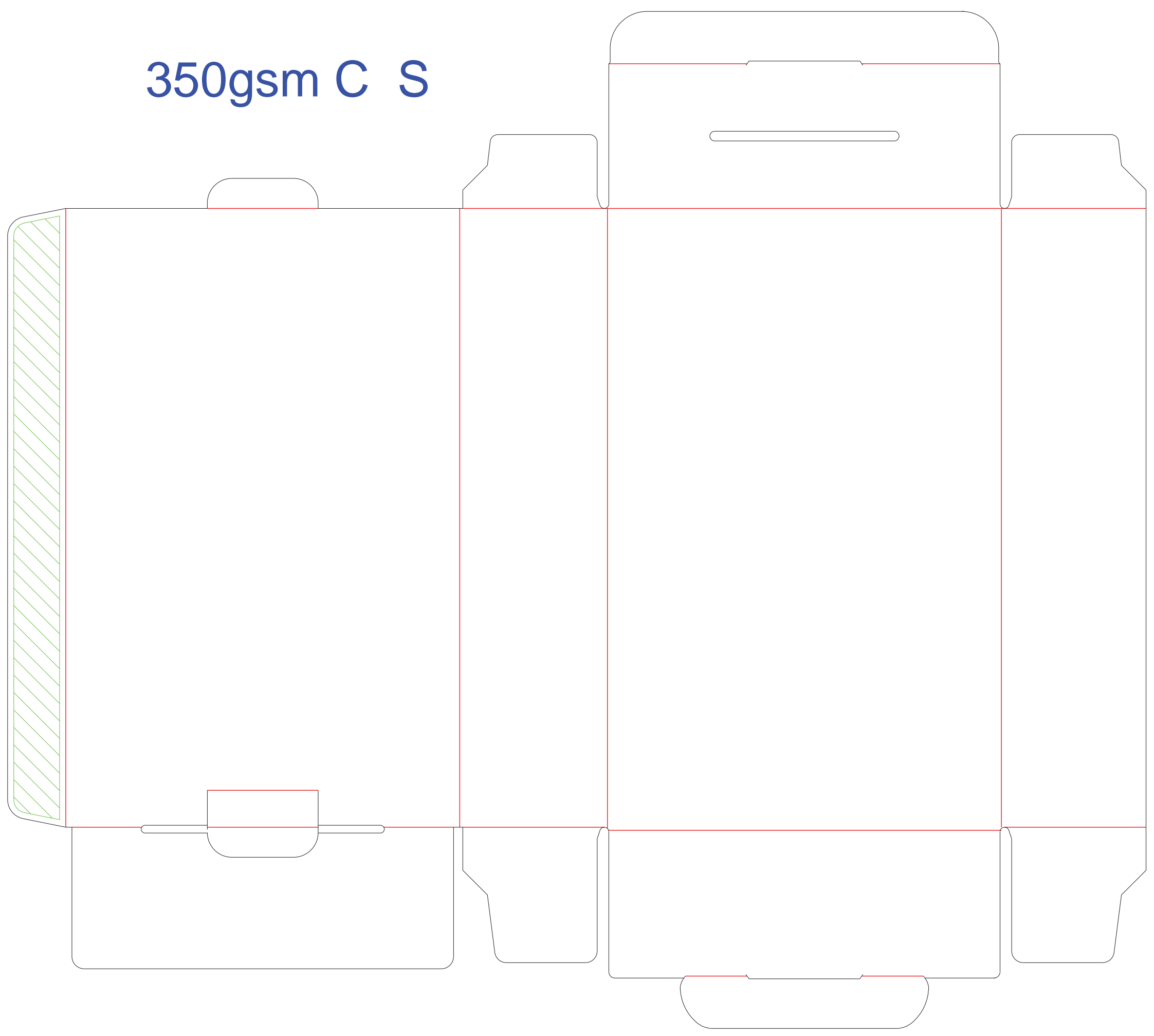
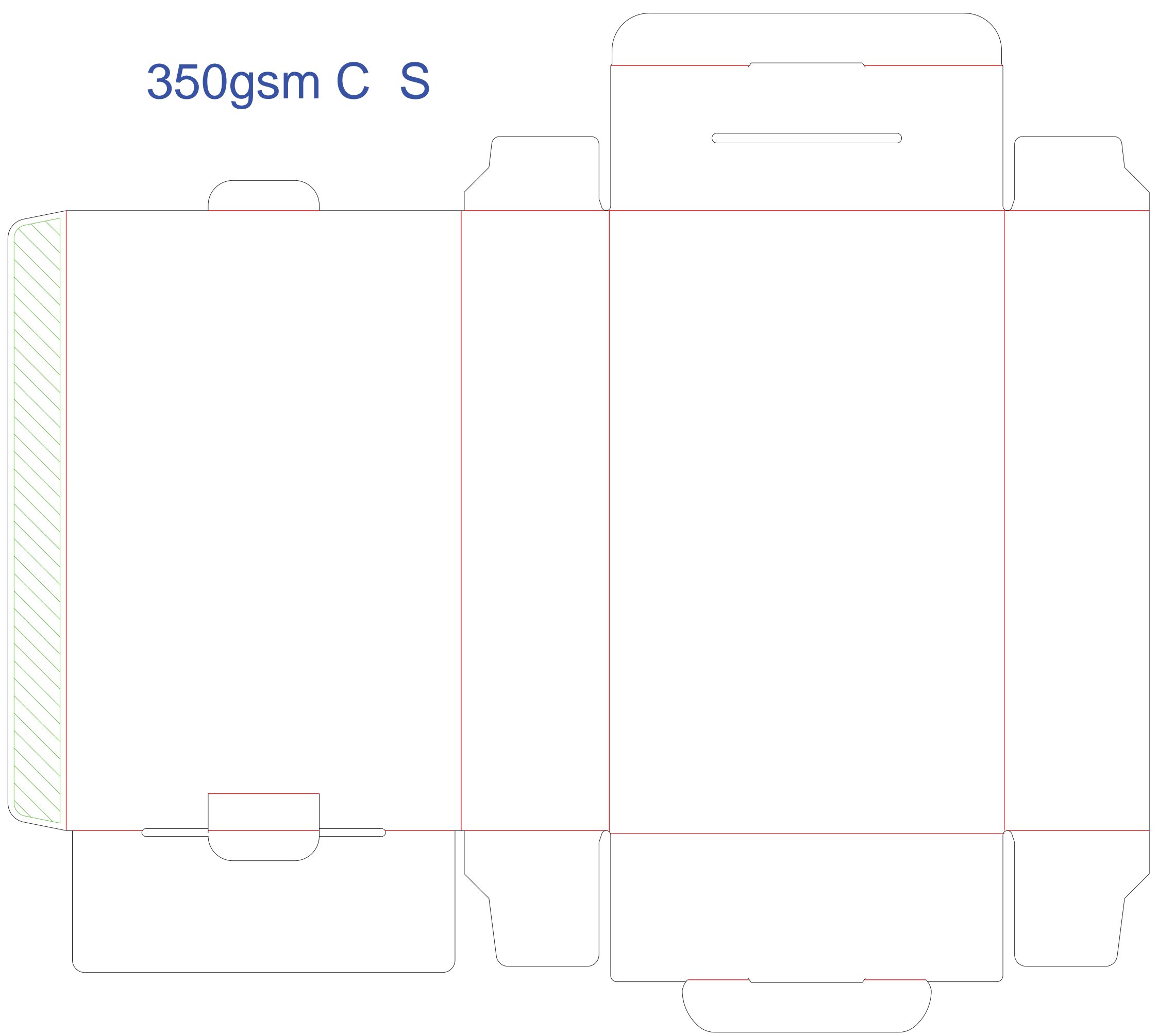
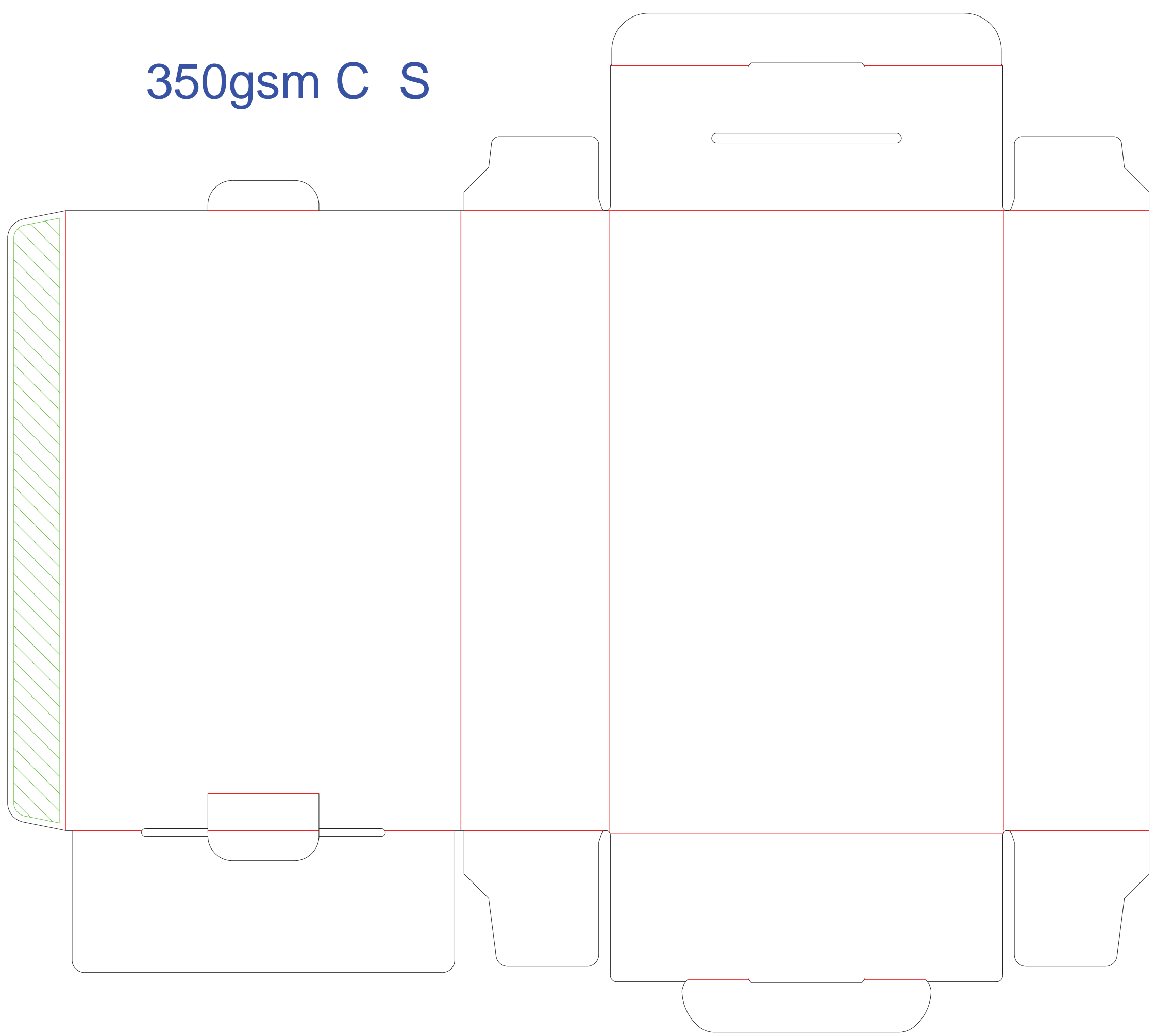
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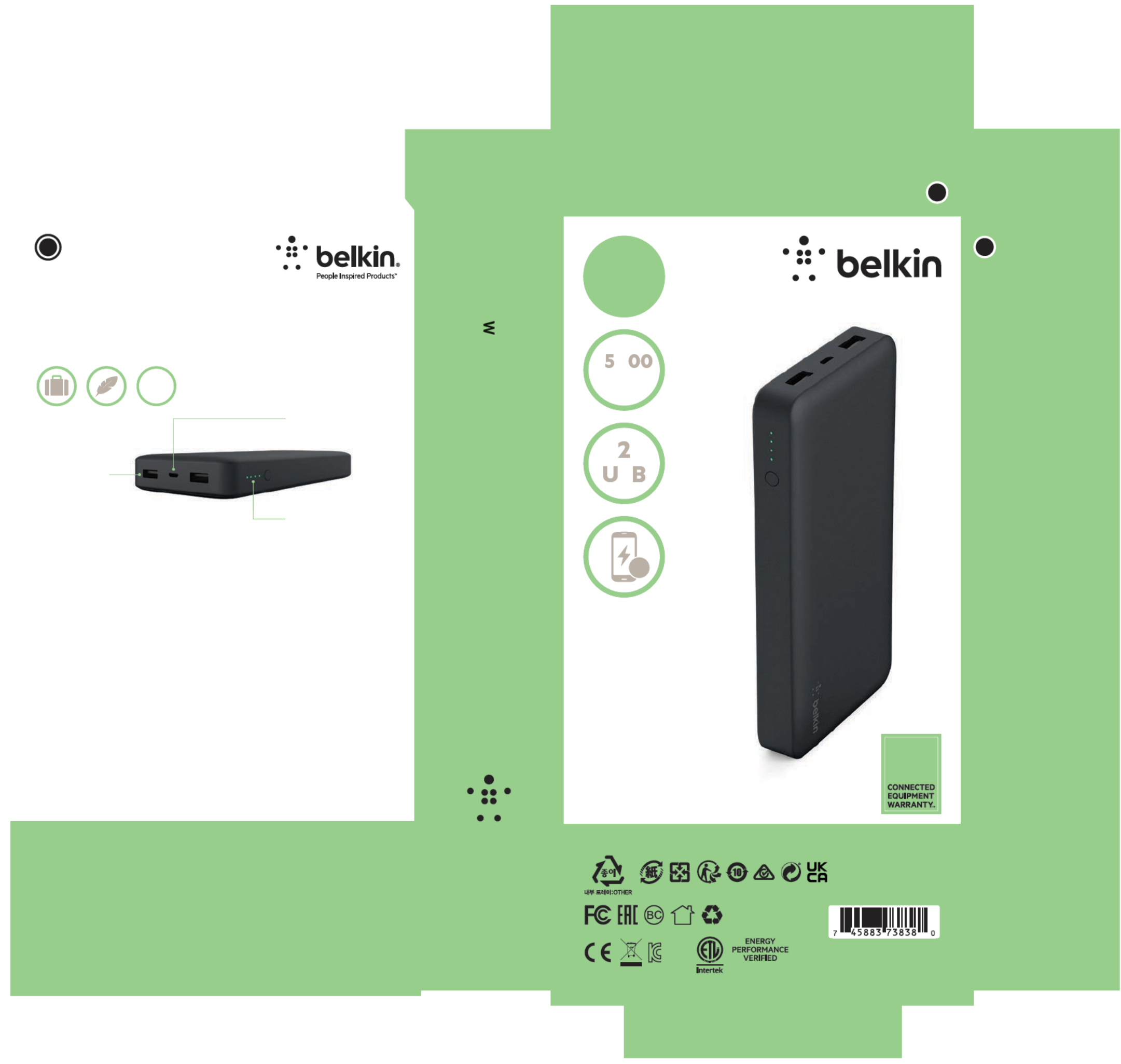
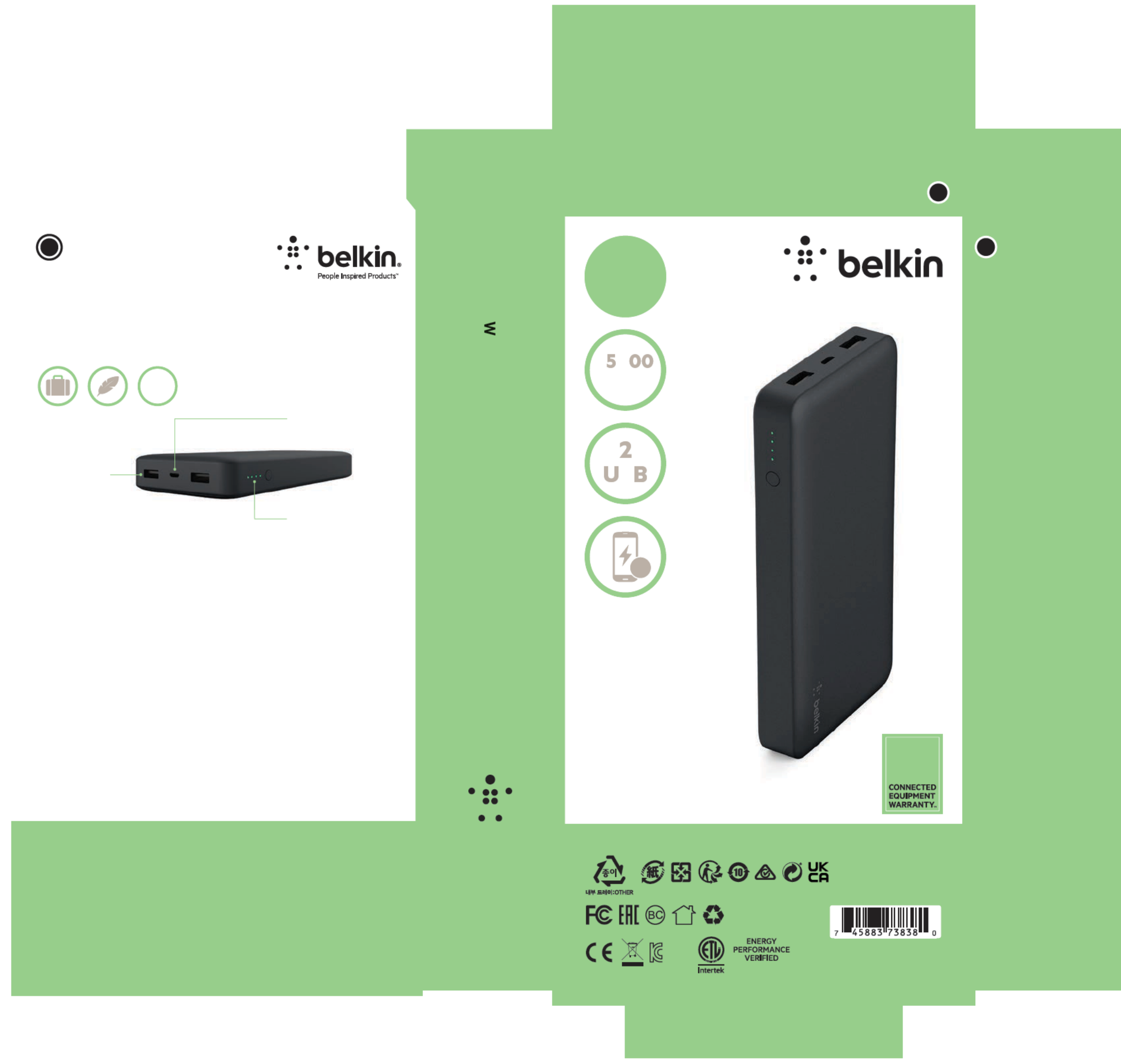
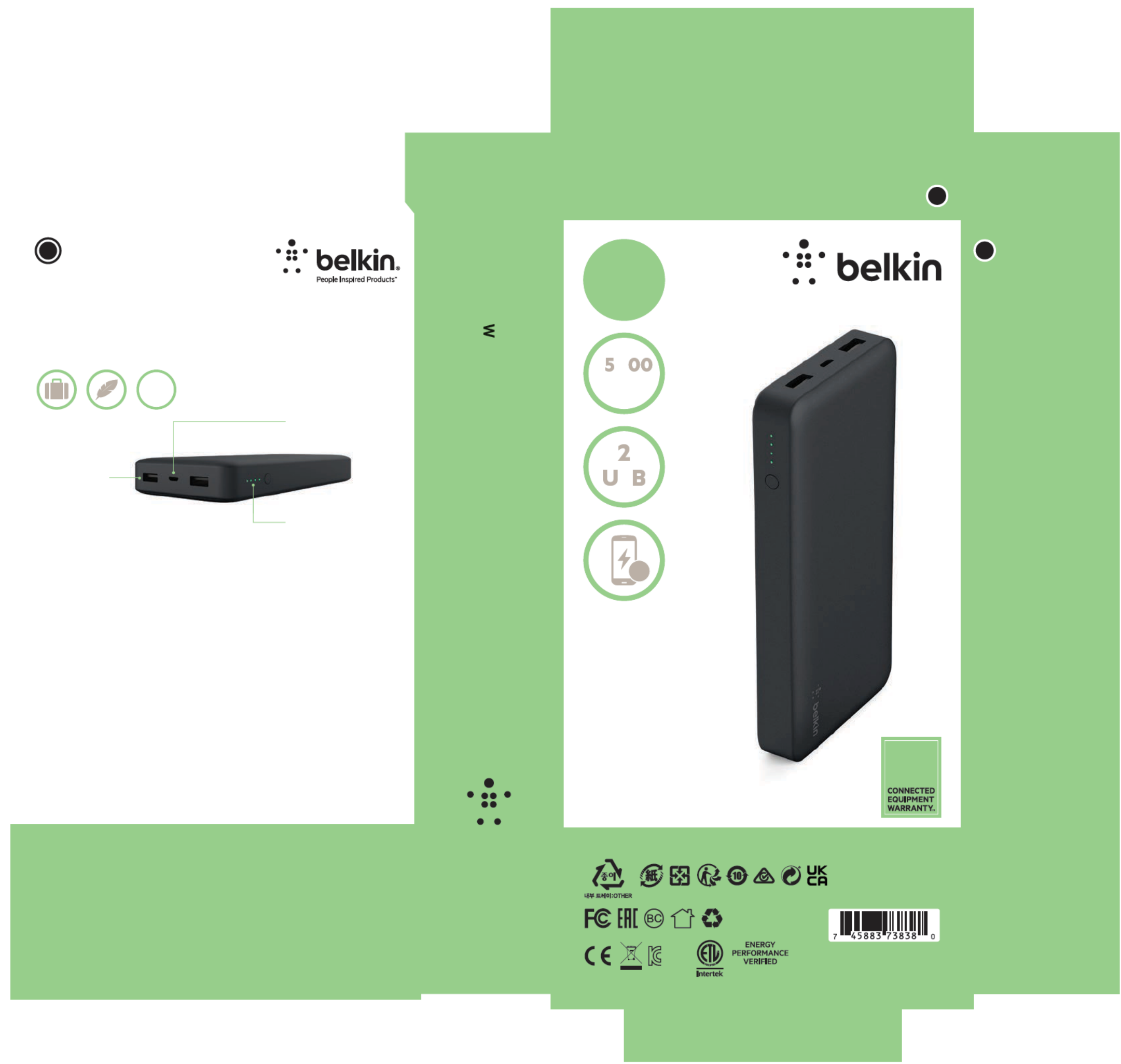
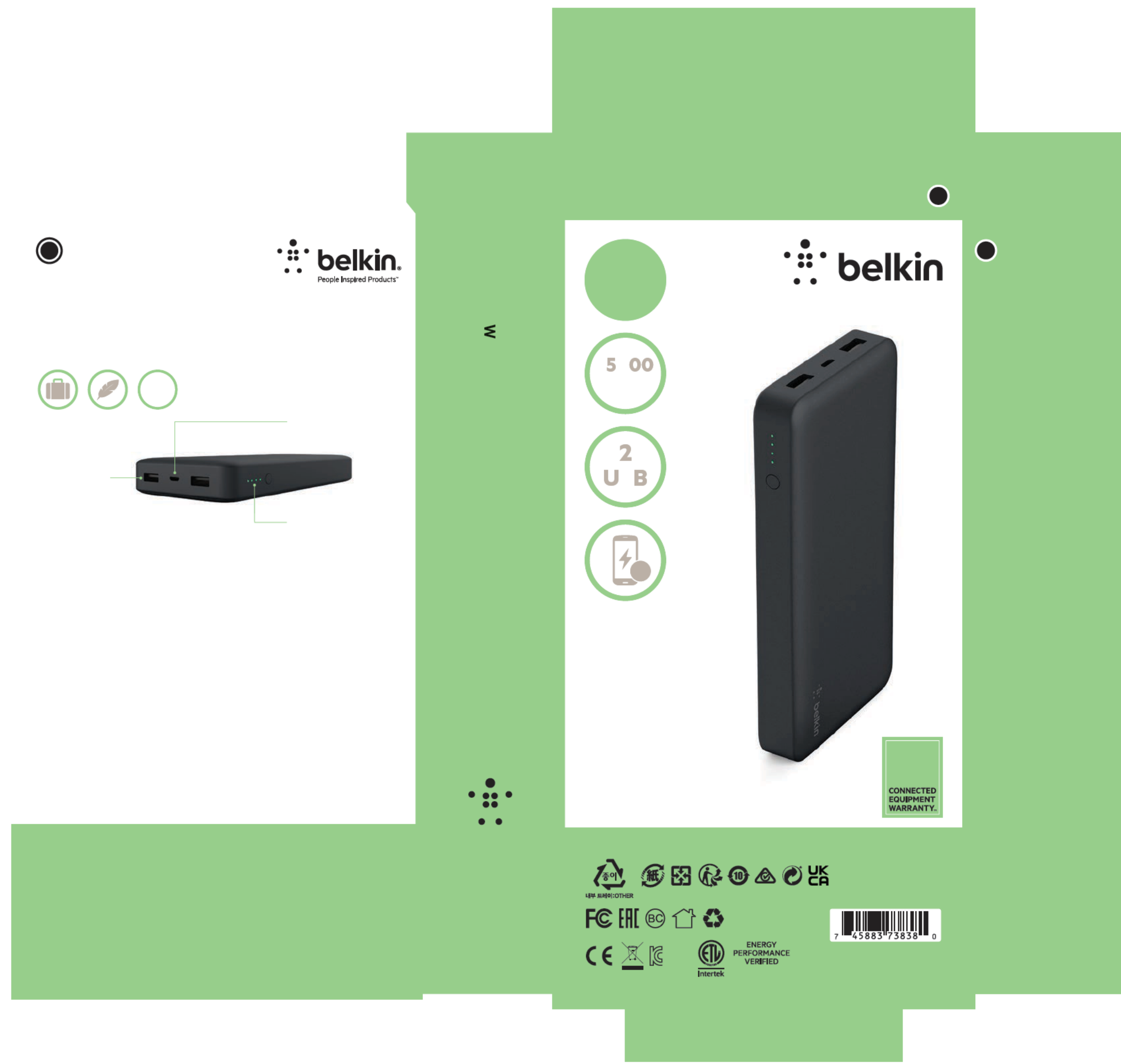
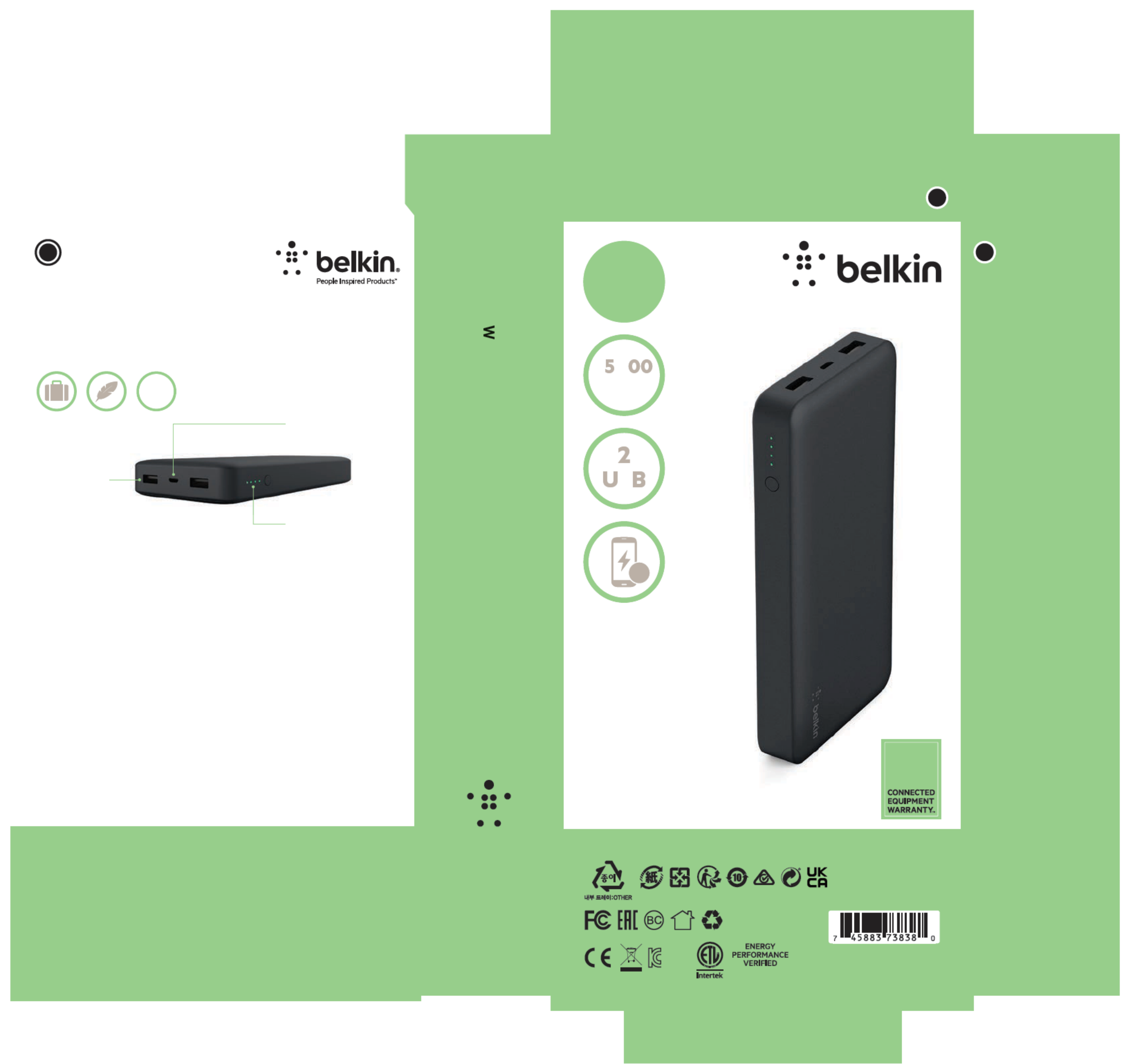
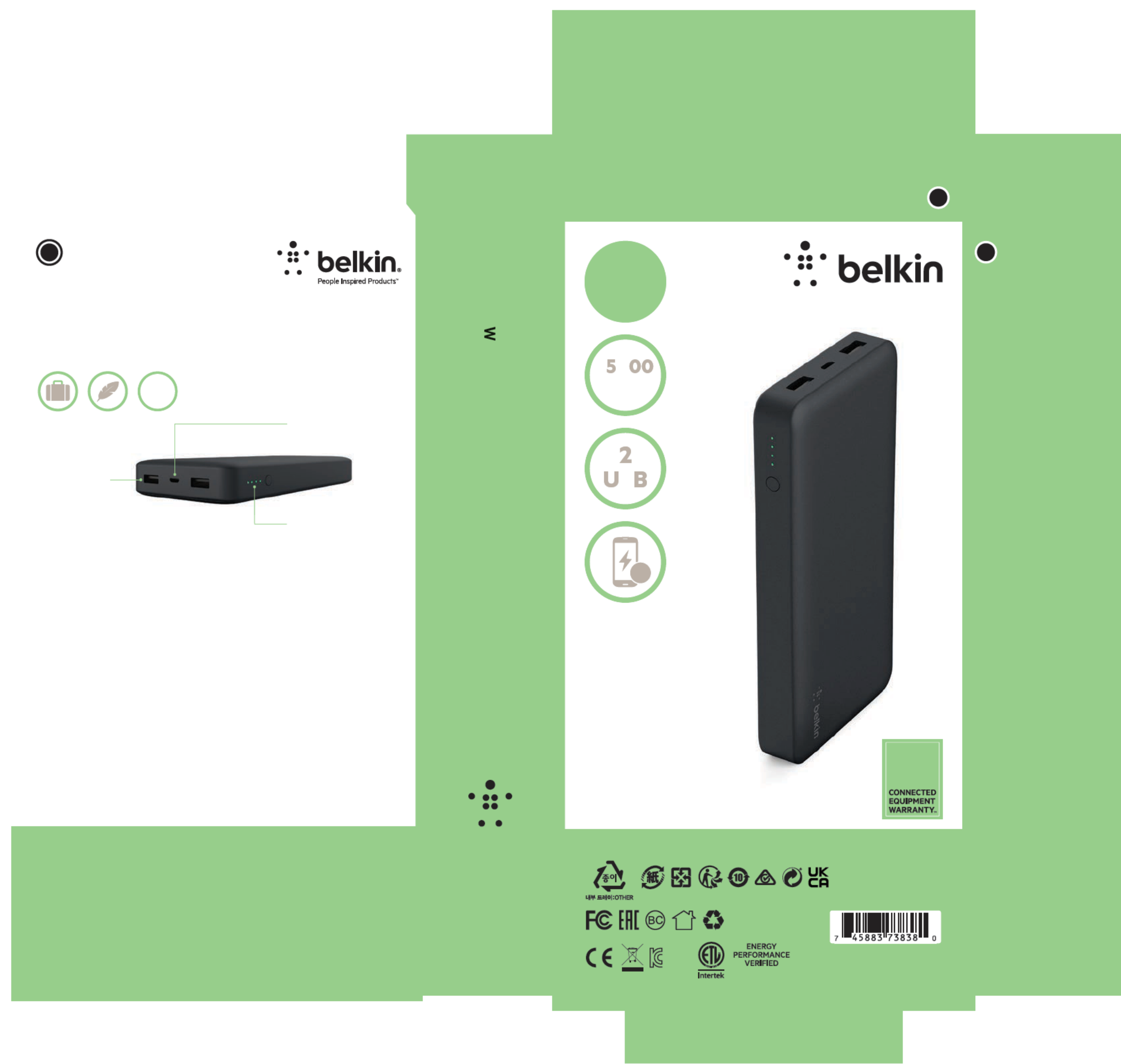


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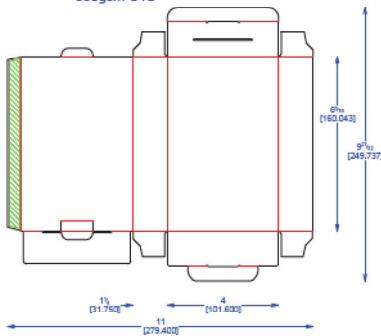
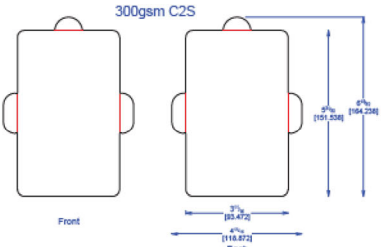
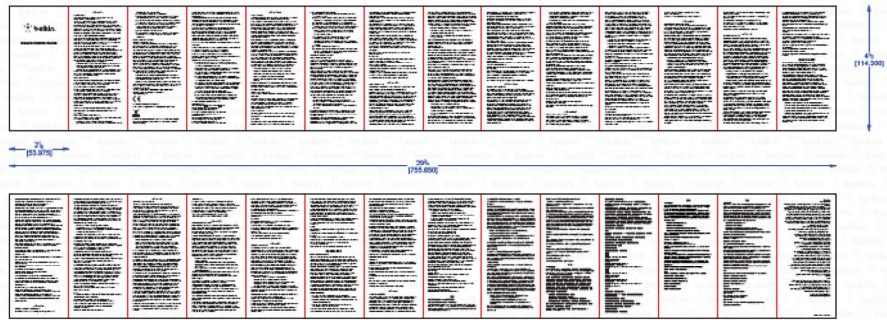
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DIE LAYOUT				<div>Business Unit: KVM-AcessSolution</div> <div>Program Manager:</div> <div>Packaging Engineer: Matthew Duffy</div> <div>Retail Outside Dimension (Including Hang Tab) L x W x D (in): 4 x 1 x 6 L x W x D (mm):101.60 x 25.40 x 152.40</div> <div>DIE/MATERIAL SPECS: Material: Please refer to drawing Blank Size (in): 45.044 x 20.566 Blank Size (mm): 1144.107 x 522.366</div> <div>This dieline works for following skus (if any):</div> <div>Unit: IN/MM Side Shown: PRINT SIDE Flute/Grain: horizontal Tolerance:+/- 1/32" - 0.8mm Drawing Scale 1:1</div> <div>RELEASE DATE: 05/24/2018</div> <div>DIELINE: Intermediate</div> <div>THIS DOCUMENT & THE INFORMATION IN IT ARE THE CONFIDENTIAL PROPERTY OF BELKIN INTERNATIONAL AND MUST NOT BE COPIED, REPRODUCED OR USED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF BELKIN CORPORATION. IT MUST BE RETURNED UPON REQUEST</div>																																																																																																																																																																																																																						
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Thank you for your cooperation.		1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	18	19	19	20	20	21	21	22	22	23	23	24	24	25	25	26	26	27	27	28	28	29	29	30	30	31	31	32	32	33	33	34	34	35	35	36	36	37	37	38	38	39	39	40	40	41	41	42	42	43	43	44	44	45	45	46	46	47	47	48	48	49	49	50	50	51	51	52	52	53	53	54	54	55	55	56	56	57	57	58	58	59	59	60	60	61	61	62	62	63	63	64	64	65	65	66	66	67	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	84	84	85	85	86	86	87	87	88	88	89	89	90	90	91	91	92	92	93	93	94	94	95	95	96	96	97	97	98	98	99	99	100	100	<div>PRINT SPECS:</div> <div>Color Plates:</div> <div>Finish:</div> <div>Notes:</div>
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From: Vijendra Nalwad <VJN@belkin.com>
Date: Wednesday, May 9, 2018 at 7:23 PM
To: Norbert von Boode <Norbert.vonBoode@belkin.com>
Cc: Marco Peters <marcop@belkin.com>, Melody Saffery <Melody.Tecson@belkin.com>, Andrew Camba <Andrew.Camba@belkin.com>, Nick Kalra <Nick.Kalra@belkin.com>, Rajesh Karki <Rajesh.Karki@belkin.com>
Subject: RE: UL/ETL Certification for Power Banks

+Ernie and Stu.

Norbert,

Have we confirmed there are no risks from a transportation / logistics standpoint and legal standpoint?

Thanks,

VJ.

From: Norbert von Boode
Sent: Wednesday, May 9, 2018 6:36 PM
To: Vijendra Nalwad <VJN@belkin.com>
Cc: Marco Peters <marcop@belkin.com>; Melody Saffery <Melody.Tecson@belkin.com>; Andrew Camba <Andrew.Camba@belkin.com>; Nick Kalra <Nick.Kalra@belkin.com>; Rajesh Karki <Rajesh.Karki@belkin.com>
Subject: UL/ETL Certification for Power Banks

Hi VJ,

I heard Rajesh gave you a heads up on this, but we would like to move ahead and remove the UL/ETL certification from our power banks.

Belkin initially received this voluntary certification, which no specific country or customer requires, to leverage it as competitive advantage in quality over competitors. However, with the recent changes that mandates UL/ETL certified power banks to put both rated and cell capacity on the product, we've been creating a confusion with two different capacities communicated and receiving multiple inquiries on this from different customers across the globe. The latest inquiry was from Rogers, who ceased sales on our power banks and we're currently addressing this.

We would like to remove the UL/ETL certification requirement from our power banks, but continue testing internally based on UL/ETL standards to maintain our quality expectations. Attached are details we prepared for this week's escalation meeting, but unfortunately it didn't happen because of FIT's visit.

I wanted to reach out to you as the gatekeeper of quality to seek your recommendation. I talked with Melody as well about this and she is aligned.

Thank you,
Norbert



TEST REPORT

SCOPE OF WORK

UL SUBJECT 2056 EVALUATION FOR RECHARGEABLE LI-ION BATTERY PACK

PRODUCT/ MODEL:

RECHARGEABLE LI-ION BATTERY PACK / F7U020

RATING:

INPUT: 5 V_{DC}, 2 A; OUTPUT: 5 V_{DC}, 2.4 A, 6070 mAh (each port 2.4A max.)

APPLICANT:

BELKIN INTERNATIONAL INC.

REPORT NUMBER

180700076TWN-001

ISSUE DATE

3-August-2018

PAGES

29

DOCUMENT CONTROL NUMBER

GFT-OP-10h (6-July-2017)

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Belkin International Inc.
Intertek Report: No: 180700076TWN-001

TEST REPORT

3-August -2018

Intertek Project No.: TWJ18070159

Belkin International Inc.
12045 East Waterfront Drive,
Playa Vista, CA 90094, USA
Jay Tu
Jay.Tu@belkin.com

Ph: 310 751 5559

Subject: UL SUBJECT 2056 EVALUATION for the RECHARGEABLE LI-ION BATTERY PACK, MODEL F7U020.

Dear Mr. Tu,

This test report represents the results of our evaluation of the above referenced product(s) to the requirements contained in the following standards:

METHODS PER ISO 17025 5.10.2.e

DESCRIPTION OF STANDARDS

UL SUBJECT 2056 ED.2, OUTLINE OF INVESTIGATION FOR SAFETY OF POWER BANKS

SAMPLES PROVIDED PER ISO 17025 5.10.2.f,g

SAMPLE #	SAMPLE RECEIVED	AMOUNT
P170400053	2017/04/20	80

TESTED <26-April-2017> to <11-May-2017>

SCOPE OF RESULTS PER ISO 17025 5.10.2.k

The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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Belkin International Inc.
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TEST REPORT

RESULTS PER ISO 17025 5.10.2.i

Please See the Appendix for detail.

MEASUREMENT UNCERTAINTY PER ISO 17025 5.10.3.1.c

Per ISO 17025 5.4.6.2, NOTE 2 a well-recognized test method was used that specifies the limits on major sources of uncertainty and controls the presentation and calculation of results.

REPORT AUTHORIZED PER ISO 17025 5.10.2.j

When signed with physical or electronic signature, the contents of this report have been prepared and approved per Intertek's quality process in accordance with ISO 17025.

A handwritten signature in blue ink, appearing to read "JWang", is positioned above a solid black horizontal line.

Jordano Wang
Project Engineer

A handwritten signature in blue ink, appearing to read "DChen", is positioned above a solid black horizontal line.

Dan Chen
Assistant Manager

Intertek Testing Services Taiwan Ltd
5F, No. 423, Ruiguang Road, Neihu District, Taipei 114, Taiwan
Telephone: +886-2-6602-2888
www.intertek.com



Belkin International Inc.
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APPENDIX

General information:

The tested product is a Rechargeable Li-Ion Battery Pack for use in a general environment and the equipment is considered as a portable type equipment. The cell electrolyte is liquid type.

The Rechargeable Li-Ion Battery Pack, model F7U020, is equipped with one cell (1S1P) and the capacity is 6070 mAh.

The EUT has one micro USB input port and two USB output port, and classified as SELV circuit. The enclosures are fixed together by mechanical fixing.

The product was submitted and evaluated for the manufacturer's recommended maximum ambient (Tmra) 40 degree C for charge and discharge 40 degree C conditions.

The charging / discharging specification are listed as below:

Maximum Continue Charging Voltage/ Current: 5.25 Vdc / 2 A

Maximum Continue Discharge Current or Power: 2.4 A (USB1 output or USB 2 output or USB1+USB2 output)

Note:

- 1) The testing results relate only to the items tested.
- 2) The test report shall not be reproduced except in full, without written approval of the laboratory.
- 3) The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.
- 4) When determining the test conclusion, the Measurement Uncertainty of test has been considered.
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Tests to be conducted:

TEST PERFORMED	PARAGRAPH	COMMENTS
Short Circuit Test (At room Temperature)	8.1	PASS
Short Circuit Test (At 55 degree C)	8.1	PASS
Abnormal Charging Test	8.4	PASS
Abusive Overcharge Test	8.5	PASS
Limited Power Sources Test	8.9	PASS
Battery Pack Component Temperature Test	8.6	PASS
Battery Pack Surface Temperature Test	8.6	PASS
250 N Steady Force Test	8.1	PASS
Mold Stress Relief Test	8.1	PASS
Drop Impact Test	8.1	PASS
Power input test	9.1	PASS
Overload of output port test	10.2	PASS
Capacity verification test	12.2	PASS

Testing Laboratory:

Intertek Testing Services Taiwan Ltd.
5F, No. 423, Ruiguang Road, Neihu District, Taipei 114, Taiwan



Belkin International Inc.
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Test Method and Test Results:

SHORT CIRCUIT TEST (At Room Temperature):

Method:

The battery packs were subjected to the Short Circuit Test in accordance with Sec. 9 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Five fully charged battery packs were used for this test.

Each test sample battery pack, in turn, was short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a resistance load of 80 ± 20 m ohm. The battery was discharged until a fire or explosion was obtained, or until it had reached a completely discharged state of less than 0.2 volts and/or the cell case temperature (T_{max}) had returned to $\pm 10^\circ\text{C}$ of ambient temperature. Tests were conducted at room temperature ($20 \pm 5^\circ\text{C}$), and the batteries reached $20 \pm 5^\circ\text{C}$ before the terminals were connected.

Battery pack constructions were subjected to a single fault across any protective device not investigated for the purpose in the load circuit of the battery under test as outlined in General-Protective Device. The protective devices faulted were documented.

One of the above five test sample battery packs was not subjected to single faults across any electrical protective device but instead evaluated with the following additional abnormal conditions in place:

The terminals were subjected to a short circuit condition with a minimum length of No. 16 AWG (1.3 mm^2) bare copper wire. The test was conducted on a tissue paper covered soft wood surface. The sample battery pack and bare conductor were covered with a single layer of cheesecloth. An additional maximum temperature was measured on the cell casings.

Result:

Battery Pack Sample with No 16 AWG Short Circuit Wire Applied
(Not Subjected to Single Fault Conditions with Short Circuit)

Item No.	Initial open circuit Voltage, V	Resistance load (80 ± 20 m Ω)	Maximum Temperature on Cell Case (T_{max}), $^\circ\text{C}$	Comments
1	5.15	16 AWG bare copper wire	20.8	Sample remained intact.

The samples did not explode or catch fire .

The cheesecloth and tissue paper did not catch fire on the sample short circuited with a No. 16 AWG wire.

The maximum battery casing temperature, (T_{max}) did not exceed 150°C .



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Remaining Faulted Battery Pack Samples

Item No.	Initial open circuit Voltage, (V)	Resistance load (80±20 mΩ)	Maximum Short Circuit Current, (A)	Maximum Temperature on Cell Case (T _{max}), (°C)	Comments
Model : F7U020					
2	5.16	—	2.87	39.5	Sample remained intact
3	5.16	—	2.87	41.4	Sample remained intact
4	5.14	—	2.5	36.6	Sample remained intact
5	5.13	—	3.2	42.0	Sample remained intact
Item No.	Battery Component Fault Description/Comments				
2	Q4, Pin 1, D - Pin 3, S2 Short circuit				
3	Q4, Pin 1, D - Pin 3, S2 Short circuit				
4	Q10, Pin 2 - Q11, S2 Pin 6 Short circuit				
5	R12 Short circuit				

The samples did not explode or catch fire .

The cheesecloth and tissue paper did not catch fire on the sample short circuited with a No. 16 AWG wire.

The maximum battery casing temperature, (T_{max}) did not exceed 150°C.



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Intertek Report: No: 180700076TWN-001SHORT CIRCUIT TEST (At 55°C): (Section 9)Method:

The battery packs were subjected to the Short Circuit Test at 55°C in accordance with Sec. 9 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Five fully charged battery packs were used for this test.

Each test sample battery pack, in turn, was short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a resistance load of 80 ± 20 m ohm. The battery was discharged until a fire or explosion was obtained, or until it had reached a completely discharged state of less than 0.2 volts and/or the cell case temperature (T_{max}) had returned to $\pm 10^\circ\text{C}$ of ambient temperature. The samples reached equilibrium at $55 \pm 5^\circ\text{C}$ before the terminals were connected, and tests were conducted at $55 \pm 5^\circ\text{C}$.

Battery pack constructions were subjected to a single fault across any protective device not investigated for the purpose in the load circuit of the battery under test as outlined in General – Protective Devices. The protective devices faulted were documented.

Results:

Item No.	Initial open circuit Voltage, (V)	Resistance load (80 ± 20 m Ω)	Maximum Short Circuit Current, (A)	Maximum Temperature on Cell Case (T_{max}), ($^\circ\text{C}$)	Comments
6	5.16	—	2.55	59.4	Sample remained intact
7	5.16	—	2.55	59.6	Sample remained intact
8	5.14	—	2.43	61.1	Sample remained intact
9	5.15	—	2.43	61.1	Sample remained intact
10	5.12	—	2.78	63.0	Sample remained intact
Item No.	Battery Component Fault Description/Comments				
6	Q4, Pin 2, D - Pin 3, S2 Short circuit				
7	Q4, Pin 2, D - Pin 3, S2 Short circuit				
8	Q10, S1 Pin 2 - Q11, S2 Pin 6 Short circuit				
9	Q10, S1 Pin 2 - Q11, S2 Pin 6 Short circuit				
10	R12 Short circuit				

The samples did not explode or catch fire. There were no leaks caused by cracking, rupturing or bursting of the internal cell casings.

The maximum battery casing temperature, (T_{max}) did not exceed 150°C .



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Intertek Report: No: 180700076TWN-001ABNORMAL CHARGING TESTS:Method:

The battery packs were subjected to the Abnormal Charging Test in accordance with Sec. 10 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Five fully charged battery packs were used for this test.

The battery packs were tested in an ambient temperature of $20 \pm 5^{\circ}\text{C}$. A thermocouple was attached to each test sample battery.

Each battery was discharged at a constant current of 0.2C/1 hour to a manufacturer specified discharge endpoint voltage.

The battery pack was subjected to single component fault that was likely to occur in the charging circuit, which resulted in overcharging of the battery. Protective components not investigated for the purpose as outlined in General – Protective Devices, that were faulted were documented.

Results:

Battery Capacity 10000 mAh, Samples discharged at 2000 mA to 3 V endpoint voltage prior to testing.

Maximum Charging Voltage, V_c 5.25 V dc,

Maximum Target Charging Current, $I_{max} = (3 \times I_c) = 15 \text{ A}$

(I_c = Maximum rated charging current, 5 A)

The dc/dc converter circuitry need to be bypassed in advance: Q2 pin 3 and pin 5 short.

Item No.	Target Maximum Charge Current, I_{max} , A	Measured Maximum Charge Current, I_{max} , A	Target Maximum Charge Voltage, V dc	Measured Maximum Charge Voltage, V dc	Test Time, hrs	Maximum Internal Cell Casing Temperature T_{max} , $^{\circ}\text{C}$	Comments
Model: F7U020							
11	15	6.24	5.25	5.25	14	33.5	See Note 1)
12	15	5.71	5.25	5.25	14	32.5	See Note 1)
13	15	5.15	5.25	5.25	14	30.2	See Note 1)
14	15	0	5.25	5.25	14	22.7	See Note 1)
15	15	0	5.25	5.25	14	22.6	See Note 1)
Item No.	Battery Component Fault Description/Comments						
11	Q10, S1 Pin 2 – Q11, Pin 6 Short circuit						
12	Q10, S1 Pin 2 – Q11, Pin 6 Short circuit						
13	Q10, S1 Pin 2 – Q11, Pin 6 Short circuit						
14	R14 Short circuit						
15	R14 Short circuit						

Note 1): Sample remained intact

There were no fires or explosions as a result of tests.

There were no chemical leaks caused by cracking, rupturing or bursting of the internal cell jacket.

The maximum battery casing temperature, (T_{max}) did not exceed 150°C .



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Intertek Report: No: 180700076TWN-001ABUSIVE OVERCHARGE TEST:Method:

The battery packs were subjected to this test in accordance with Sec. 11 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Five fully charged samples are to be tested. The samples were discharged to the manufacturer's specified voltage end point prior to testing. The battery packs were tested in an ambient temperature of $20 \pm 5^{\circ}\text{C}$. A thermocouple was attached to each test cell or battery of the battery pack.

Sample batteries were subjected to a constant charging current at 10 times the C_5 amp rate using a supply voltage, sufficient to maintain the 10 times C_5 amp rate, throughout the duration of the test or until the protective devices actuated. The test was continued until the cell or battery exploded, vented, or the temperature of the outer casing reached a steady state condition or returned to ambient.

At least one of above five samples were subjected to a constant charging current at 5 times the C_5 amp rate using a supply voltage, sufficient to maintain the 5 times the C_5 amp rate.

Battery pack constructions were subjected to a single fault across any protective device in the charging circuit of the battery, which would result in overcharging of the battery under test. The protective devices not investigated for the purpose (as outlined in General – Protective Devices) that were faulted were documented.

Results:

Maximum supply voltage 6Vdc; Capacity (C): 10000 mAh

C_5 Target current: $[I(C_5)\text{mA} = 0.2 \times C \text{ mAh/1h}]$ 2000 mA; $10 \times I(C_5) =$ 20000 mAh; $5 \times I(C_5) =$ 10000 mAh.

The dc/dc converter circuitry need to be bypassed in advsnce: __ Q2 pin 3 and pin 5_short __.

Item No.	Target Charge Current ($5 \times I(C_5) / 10 \times I(C_5)$), mA	Maximum Measured Charge Current, (mA)	Final Charge Current, (mA)	Maximum Internal Cell Case Temperature, ($^{\circ}\text{C}$)	Comments
Model: F7U020					
16	20000	8318	0	23.8	Sample remained intact
17	20000	8145	0	23.3	Sample remained intact
18	20000	8108	0	23.8	Sample remained intact
19	10000	3089	0	23.6	Sample remained intact
20	10000	3147	0	23.5	Sample remained intact
Item No.	Battery Component Fault Description/Comments				
16	Q10, S1 Pin 2 – Q11, Pin 6 Short circuit				
17	Q10, S1 Pin 2 – Q11, Pin 6 Short circuit				
18	Q10, S1 Pin 2 – Q11, Pin 6 Short circuit				
19	R14 Short circuit				
20	R14 Short circuit				

The samples 16~20 did not explode or catch fire.

Note 1): Sample remained intact.

Note 2): Following the client requires using the worst case.



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LIMITED POWER SOURCE TEST:

Method:

The battery packs were subjected to the Limited Power Test in accordance with Sec. 13 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Six fully charged samples were subjected to this test. Testing occurred in an ambient of $20 \pm 5^\circ\text{C}$.

The open circuit voltage (U_{oc}) at the battery terminals was recorded. In addition the maximum output current including the short circuit current (I_{sc}) and the maximum power output (VA) after 60 seconds under normal and fault conditions were recorded.

Battery pack constructions were subjected to a single fault across any protective device not investigated for the purpose as outlined in General- Protective Devices, in the load circuit of the battery under test. The protective devices faulted were documented.

An output was considered to be limited power if it complied with one of the following:

- The output was inherently limited (without protective devices, limiting impedances, or regulating networks) in compliance with table 13.1.
- A linear or nonlinear impedance limits the output in compliance with Table 13.1. (PTC's relied upon for a limited power output complied with relevant requirements.)
- A regulating network or an integrated circuit (IC) current limiter, limits the output in compliance with Table 13.1 under both normal and any single fault condition in the regulating network or IC current limiter (open circuit or short circuit);
- An overcurrent protective device, such as a fuse, was relied upon to limit the output in compliance with Table 13.2.

Table 13.1
Limits for power sources without an overcurrent protective device

Revised Table 13.1 effective November 11, 2011

Output voltage U_{oc} , V d.c. ^a	Output current I_{sc} , amperes ^{b,d}	Apparent power S, VA ^{c,d}
$U_{oc} \leq 30$	≤ 8.0	≤ 100
$30 < U_{oc} \leq 60$	$\leq 150/U_{oc}$	≤ 100

^a U_{oc} – Open circuit battery voltage with all load circuits disconnected.
^b I_{sc} – Maximum output current with any non-capacitive load, including a short circuit.
^c S(VA) – Maximum output VA with any non-capacitive load including short circuit.
^d Measurement of I_{sc} and S are made 5 s after application of the load if protection is by an electronic circuit or a positive temperature coefficient device, and 60 s in other cases. If multiple protections are provided, such as combination of electronic circuit and positive temperature coefficient device, I_{sc} and S are measured 60 s after the application of the load with or without single fault condition applied.

Table 13.2
Limits for battery sources (with overcurrent protective device)

Table 13.2 revised September 14, 2011

Output Voltage U_{oc} , V d.c. ^a	Output Current I_{sc} , amperes ^{b,d}	Apparent Power S, VA ^{c,d}	Current Rating of Overcurrent Protective Device, amperes ^e
≤ 20			≤ 5
$20 < U_{oc} \leq 30$	$\leq 1000/U_{oc}$	≤ 250	$\leq 100/U_{oc}$
$30 < U_{oc} \leq 60$			$\leq 100/U_{oc}$

^a U_{oc} – Open circuit battery voltage with all load circuits disconnected.
^b I_{sc} – Maximum output current with any non-capacitive load, including a short circuit, measured 60 s after application of the load.
^c S(VA) – Maximum output VA after 60 s of operation with any non-capacitive load including short circuit.
^d Current limiting impedances remain in the circuit during measurement, but overcurrent protective devices are bypassed.
^e The current ratings of overcurrent protective devices are based on fuses and circuit breakers that break the circuit within 120 s with a current equal to 210% of the current rating specified in the table.
 NOTE – The reason for making measurements with overcurrent protective devices bypassed is to determine the amount of energy that is available to cause possible overheating during the operating time of the overcurrent protective devices.

Where an overcurrent protective device is used, it shall be a fuse or a non-adjustable, nonautoreset, electromechanical device.

Batteries shall be fully charged when conducting the measurements for U_{oc} and I_{sc} according to Tables 13.1 and 13.2.



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The non-capacitive load referenced in Tables 13.1 and 13.2 shall be adjusted to develop maximum measured values or current (I_{sc}) and power (S) that can be obtained over the time limits noted in Tables 13.1 and 13.2. Simulated faults in a regulating network required according to 13.2 item (c) above are applied under these load conditions.

Results:

13	TABLE: Limited power sources					P
Circuit output tested: USB port						
Note: Measured Uoc (V) with all load circuits disconnected:						
Components	Sample No.	Uoc (V)	I _{sc} (A)		VA	
			Meas.	Limit	Meas.	Limit
F7U020						
Normal	21	5.15	2.77	≤ 8.0 A	10.36	≤ 100 VA
Single fault condition ((Q4, Pin 2, D - Pin 3, S2), short circuit)	22	5.15	3.45	≤ 8.0 A	12.06	≤ 100 VA
Single fault condition (Q10, S1 Pin 2-Q11, S2 Pin 6 short circuit)	23	5.15	2.75	≤ 8.0 A	9.92	≤ 100 VA
Single fault condition (R12 short circuit)	24	5.15	4.74	≤ 8.0 A	15.31	≤ 100 VA
supplementary information:						
Sc=Short circuit, Oc=Open circuit						

The models tested were considered as Limited Power Source.



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BATTERY PACK COMPONENT TEMPERATURE TEST:

Method:

The battery packs were subjected to the Battery Pack Component Temperature Test in accordance with Sec. 13A of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

A battery pack with enclosure shall be subjected to a normal temperature test under both input (charging) and output (discharging) conditions. As a result of this testing, temperatures on temperature sensitive components shall not exceed the limits outlined in Table 13A.1.

Table 13A.1
Normal temperature limits – Component

Part	Maximum Temperature (T _{max}) °C
Synthetic rubber or PVC insulation of internal and external wiring	
– without temperature marking	75
– with temperature marking	The temperature marking
Components, insulation, and thermoplastic materials	a
Cell casing	b
^a Temperatures measured on components and materials shall not exceed the maximum temperature rating for that component or material including internal cells. ^b The cell casing temperature shall not exceed the manufacturer's recommended maximum temperature.	

For the output loading temperature test, a fully charged battery pack shall be subjected to a constant resistive loading across the output terminals of the pack with the output load current set to just below the operating limit of the discharging protection circuit. Temperatures are monitored until thermal stabilization or until the pack is at its specified endpoint voltage, whichever comes first.

The input loading temperature test shall be conducted on a fully discharged battery pack, discharged at a constant current of 0.2C/1 hour to a manufacturer specified discharge endpoint voltage.

For the input loading temperature test, a fully discharged sample shall be subjected to a CC-CV charging method with the maximum charging voltage not to exceed the manufacturer's recommended maximum charging voltage limits.

During the test, the charging current shall not exceed three times the maximum charge current or the operating limit of the charging protection circuit, whichever is less, during the test. Temperatures are monitored until thermal stabilization or until the pack is at its fully charged state, whichever comes first.

Temperatures are considered to be stabilized when three successive readings taken at intervals of 10 percent of the previously elapsed duration of the test, but not less than 15 minutes, indicate no further increase.

Temperatures are monitored on surfaces of components using thermocouples.

During the normal temperature test, temperature measurement T shall not exceed (T_{max} + T_{amb} – T_{ma}) where:

T is the temperature of the given part measured under the prescribed test,

T_{max} is the maximum temperature specified for compliance with the test,

T_{amb} is the ambient temperature during the test,

T_{ma} is the maximum ambient temperature permitted by the manufacturer's specification, or 25°C (77°F), whichever is greater.

During the test T_{amb} should not exceed T_{ma} unless agreed by all parties involved.



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BATTERY PACK SURFACE TEMPERATURE TEST:

Method:

The battery packs were subjected to the Battery Pack Surface Temperature Test in accordance with Sec. 13B of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

A battery pack with enclosure shall be subjected to a normal temperature test under both input (charging) and output (discharging) conditions. As a result of this testing, temperatures on temperature sensitive components shall not exceed the limits outlined in Table 13B.1.

Table 13B.1
Normal temperature limits – Surface

Accessible Surfaces	Maximum Temperature (T _{max}) °C	
	Metal	Plastic ^a
Accessible parts held continuously during normal use	55	75
Accessible surfaces held or touched for short periods only	60	85
Accessible surfaces which may be touched	70	95
^a Temperatures measured on accessible plastic enclosure surfaces shall not exceed the temperature ratings of the materials.		

For the output loading temperature test, a fully charged battery pack shall be subjected to a constant resistive loading across the output terminals of the pack with the output load current set to just below the operating limit of the discharging protection circuit. Temperatures are monitored until thermal stabilization or until the pack is at its specified endpoint voltage, whichever comes first.

The input loading temperature test shall be conducted on a fully discharged battery pack, discharged at a constant current of 0.2C/1 hour to a manufacturer specified discharge endpoint voltage.

For the input loading temperature test, a fully discharged sample shall be subjected to a CC-CV charging method with the maximum charging voltage not to exceed the manufacturer's recommended maximum charging voltage limits.

During the test, the charging current shall not exceed three times the maximum charge current or the operating limit of the charging protection circuit, whichever is less, during the test. Temperatures are monitored until thermal stabilization or until the pack is at its fully charged state, whichever comes first.

Temperatures are considered to be stabilized when three successive readings taken at intervals of 10 percent of the previously elapsed duration of the test, but not less than 15 minutes, indicate no further increase.

Protective devices within the pack shall not operate during test test.

Temperatures are monitored on the accessible surface of the pack enclosure using thermocouples.

During the normal temperature test, temperature measurement T shall not exceed (T_{max} + T_{amb} – T_{ma}) where:

T is the temperature of the given part measured under the prescribed test,

T_{max} is the maximum temperature specified for compliance with the test,

T_{amb} is the ambient temperature during the test,

T_{ma} is the maximum ambient temperature permitted by the manufacturer's specification, or 25°C (77°F), whichever is greater.

During the test T_{amb} should not exceed T_{ma} unless agreed by all parties involved.



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Results:

13A, 13B					P
	Supply voltage (V)	5.25 Vdc (Charging with full discharge battery)	Supplied by full charged battery pack (O/P:2.4A)	Supplied by full charged battery pack (USB1+USB2 O/P:2.4A)	—
	Ambient T _{min} (°C)	40	40	40	—
	Ambient T _{max} (°C)	40	40	40	—
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)
Test performed with model F7U020					
PCB near MOSFET(Q2)		74.3	103.4	98.8	130
PCB between MOSFET (Q4 and Q5)		61.7	89.5	86.2	130
PCB near IC (U2)		63.3	95.8	90.6	130
PCB near IC (U3)		61.6	95.0	89.9	130
PCB near IC (U4)		52.4	59.7	57.0	130
PCB between MOSFET (Q8 and Q9)		64.6	103.9	98.1	130
PCB between MOSFET (Q10 and Q11)		62.6	97.5	92.1	130
PCB near L2		70.5	99.7	95.5	130
Cell body		44.1	50.8	50.7	100
Inside of plastic enclosure near cell		43.4	48.4	47.7	75
External plastic enclosure outside		42.6	46.1	45.5	75
Supplementary information:					
1. The equipment was submitted and evaluated for maximum manufacturer's recommended ambient (T _{mra}) of charge 40°C and discharge 40°C.					

The samples did not explode or catch fire.

Protective devices within the pack did not operate during the test.



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250 N STEADY FORCE TEST

Method:

The samples were subjected to the 250 N Steady Force Test in accordance with Sec. 19 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

3 complete fully charged samples were tested in an ambient of $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$). Prior to testing, the samples were weighed with a suitable scale and their weight was recorded.

3 samples were subjected to a crushing force of $250 \pm 10\text{ N}$ ($56 \pm 2\text{ lbs-force}$) for a period of 5 seconds, applied in turn to the top, bottom and sides of the battery pack enclosure by means of a suitable test tool providing contact over a circular plane surface of 30mm (1.2 inches) in diameter.

The samples were examined 6 hours after testing and examined for signs of damage and venting.

If openings were created as a result of the 250 N Steady Force test, they were examined to determine that they were not located over cells or over protective circuitry and connections where damage or shorting from debris entering the enclosure could result in a hazard.

RESULTS

4.2.4	Mechanical Strength – 250 N Force Test	P
Requirement	Result	Remarks
Bare parts of ELV or hazardous parts accessible?	Yes / No	--
ELV circuits or hazardous parts protected by lacquer, cotton ... accessible?	Yes / No	--
Operational or basic insulation of parts or wiring in ELV or hazardous voltage accessible?	Yes / No	--
Unearthed conductive parts separated from ELV or hazardous parts by operational insulation or basic insulation accessible?	Yes / No	--
Can energy hazard circuits be bridged by test finger?	Yes / No	--
Are clearances and creepage distances reduced below requirements of 2.9?	Yes / No	--

The sample did not explode or catch fire.

The sample did not crack to the extent that the cells or any protective devices were exposed.



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MOLD STRESS RELIEF TEST

Method:

The samples were subjected to the Mold Stress Relief Test in accordance with Sec. 20 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Three complete samples were subjected to this test.

To prevent hazards from overheating energized cells, samples were either fully discharged prior to conditioning or provided with “dummy” cells, which were representative of the actual cells.

Each of (three) samples was placed in full-draft circulating-air oven maintained at a uniform temperature equal to the higher temperature value of the following temperatures:

- a) $T(\text{oven}) = 70^{\circ}\text{C} (158^{\circ}\text{F})$, or
- b) $T(\text{oven}) = T_{\text{ma}} + dT_{\text{enc}} + 10^{\circ}\text{C}$, where

T_{ma} is the maximum rated ambient of the battery pack, $^{\circ}\text{C}$

dT_{enc} is the maximum temperature rise (above test ambient) recorded on the (inside) battery pack enclosure during the Battery Pack Component Temperature Test of CL 13 (both input and output condition), $^{\circ}\text{C}$.

The samples remained in the oven for 7 hours.

After careful removal from the oven and after returning to room temperature ($20 \pm 5^{\circ}\text{C}$), following the conditioning described above, the samples were examined for evidence of mechanical damage, such as cracking or warping of the battery casing that would expose cells or internal protective circuitry.

If openings were created as a result of the mold stress, they were examined to determine that they were not located over cells or over protective circuitry and connections where damage or shorting from debris entering the enclosure could result in a hazard.

Note:

Above testing method is combined into a worst-case method according to UL 2054 Section 20, and UL 60950-1/CSA C22.2 No. 60950-1-07/IEC 60950-1:2005 + A1:2009 + A2:2013, Sub-clause 4.2.7.

Results:



Belkin International Inc..
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Sample No.	Oven Temp, °C	Weight Before Test in Grams	Weight After Test In Grams	Percentage of Weight Loss *	Comments	Initial Voltage (V)
F7U020						
25	70	--	--	--	Sample remained intact	--
26	70	--	--	--	Sample remained intact	--
27	70	--	--	--	Sample remained intact	--
<ul style="list-style-type: none"> * - Considered only if damage to cells was observed Oven temperature <u>70</u> °C is based upon manufacturer's declaration. Fully charged battery packs were used in this test based on manufacturer's declaration. 						

The samples did not crack / did not warp / did not melt to the extent that the cells or any protective devices were exposed.



Belkin International Inc..
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DROP IMPACT TEST:

Method:

The battery packs were subjected to the Drop Impact Test in accordance with Sec. 21 of the Standard for Household and Commercial Batteries, UL 2054, Second Edition.

Three complete fully charged battery pack samples were subjected to this test in an ambient of $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$). Prior to testing, the samples were weighed with a suitable scale and their weight was recorded.

Each of three sample batteries was dropped from height of 1 m (3.28 ft) so it strikes a concrete surface in the position that is most likely to produce adverse results. Each sample was dropped three times.

The samples were examined for venting or leakage (weighed) 6 hours after conducting the testing.

Results:

Storage in 0°C for 3 hrs.

Item No.	Weight Before Test in Grams	Weight After Test In Grams	Percentage of Weight Loss *	Point of Impact on Sample	Voltage before test (Vdc)	Comments
Model : F7U020						
28	222.77	222.77	0	Up	5.08	Sample remained intact
29	222.53	222.52	0	down	5.09	Sample remained intact
30	222.79	222.77	0	left	5.08	Sample remained intact
* -Considered only if damage to cells was observed						



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POWER INPUT TEST

METHOD

A sample of the power bank was connected to power supply source.

The built-in battery pack was put in fully discharged state, and the power bank was loaded with maximum normal load as described below.

The input current was measured during this operation.

RESULTS

Sample No.	Rated Voltage (V)	Rated Current (A)	Measured Current (A)	Condition / status
F7U020				
31	5.25	2	1.94	Empty battery pack/ charging only (I/P: USB)

The measured current did not exceed 110% of the indicated rated current.



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OVERLOAD OF OUTPUT PORT TEST

METHOD

The built-in battery of power bank was fully charged in accordance with manufacturer's specifications.

The power bank was covered with one layer of cheesecloth and placed on a wood board covered with one layer of tissue paper.

The power output pin of each output port was overloaded as below:

A suitable variable resistor was connected between the power pin and ground. The pin was loaded at maximum available current, which was considered to be the lower of:

- (1) The short-circuit current;
- (2) The current just below the trip point of any overcurrent or over-temperature protective device; or
- (3) The current just below the point at which the power bank circuitry limited the output current.

The load was maintained for one hour.

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Input current (A)	Observation
F7U020						
Output (USB1 port)	O/L	5.25	5 hrs	—	—	Observation: Temperature stabilized. No hazards, no damaged. Max. load current 2.5 A from USB output port. Damaged: — Temp: Cell body = 35.1 °C, Ambient = 22.1 °C
Output (USB1 port + USB2 port)	O/L	5.25	5 hrs	—	—	Observation: Temperature stabilized. No hazards, no damaged. Max. load current 2.5 A from USB1 + USB 2 output port. Damaged: — Temp: Cell body = 35.7 °C, Ambient = 22.1 °C
Output terminal + to -	S	5.25	24 hrs	—	—	Observation: Unit shut down immediately. No damage. Damaged: — Temp: Cell body = 55.6 °C, Ambient = 55.3 °C
Supplementary information:						
1) S: Short-circuited; O: Open-circuited; O/L: Overloaded; B: Blocked; L: Locked.						
2) Observation: The observations during and after fault condition tests.						
3) Damaged: Which component (components) damaged during the fault condition test.						
4) Temp: The maximum temperature of relevant components.						
5) Max. Voltage: The maximum accessible voltage of DC output terminal during the fault condition test.						

The cheesecloth and tissue paper remained intact.



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CAPACITY VERIFICATION TEST

METHOD

Three samples of power banks were subjected to this test.

The sample was charged in an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using the manufacturer's recommended method. Prior to charging, the sample was discharged at $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ using the manufacturer's recommended method.

The sample was stored, in an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, for not less than 1 hour and not more than 4 hours.

The sample was discharged, in an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, at a constant current equaled to rated current of its output port, until the voltage of output port equals to the end-of-discharge voltage of the port, as specified by the manufacturer.

If there are more than one output ports, consider the capacity rating of each port or the combined rating (if it is not equal to the summation of all ports).

The capacity (Ah) was determined from the parameters measured during the above step, and then compared with the rated capacity declared by the manufacturer.

If the determined capacity was lower than rated capacity, the test was repeated up to four additional times.

Result

<input checked="" type="checkbox"/> Output Port ID / <input type="checkbox"/> Combination of Ports	
Discharge Current, A	Output: 2.4A
End-of-Discharge Voltage (EODV), Vdc	3V (inner cell)
Rated Capacity, Ah	F7U020: 6070 mAh

Sample No.	Output Port ID	Cycle No.	Delivered Capacity, mAh	Delivered Percentage of Rated Capacity, %	Comments
F7U020					
32	USB 1	1	6641.09	109.4%	1
33	USB 1	1	6814.42	112.3%	1
34	USB 1	1	6772.60	111.6%	1
Comments Key (1) - Calculated capacity was greater than or equal to 100% rated capacity. (2) - Calculated capacity was less than 100% rated capacity.					

At the conclusion of testing, the delivered capacity was greater than or equal to the minimum 100% rated capacity.



Belkin International Inc..
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Critical component list:

1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
L2	interchangeable	interchangeable	4.7 μ H \pm 20%, 180 °C	Applicable parts of UL2056	Test in the appliance	
MOSFET (Q2)	CET-MOS Corp	CEM3119A	VDS: 20V (N channel), -30V (P channel), ID: 9A (N channel), -8A (P channel)	Applicable parts of UL2056	Test in the appliance	
MOSFET (Q4,Q5)	Developer Microelectronic s CO LTD	DP8205A	VDS: 20V, ID: 5A	Applicable parts of UL2056	Test in the appliance	
R12	interchangeable	interchangeable	0.022 Ω \pm 1%, 1/4W	Applicable parts of UL2056	Test in the appliance	
IC(U2, U3)	HYCON Technology Corporation	HY2113-CB1A	Overcharge detection voltage: 4.275 V \pm 0.05V, Overdischarge detection: 2.30 V \pm 0.1V	Applicable parts of UL2056	Test in the appliance	
MOSFET (Q8, Q9, Q10, Q11)	Developer Microelectronic s CO LTD	DP8204	V _{DS} : 20V, ID: 9.5A	Applicable parts of UL2056	Test in the appliance	
IC(U4)	HOLYTA	H266	V _{DD} :-0.3V~+6.5V	Applicable parts of UL2056	Test in the appliance	
NTC (Rt1)	DONGGUAN SENSICOM ELECTRONCS TECHNOLOGY co., ltd	SNS104	100K Ω at 25 °C	UL 1434	UL recognized	
Battery Cell	Jiangxi DBK Co., Ltd	1166110	Nominal voltage: 3.7V, 10000 mAh, 37 Wh. Li-ion rechargeable cell	UL1642	UL recognized	
Note:						
1) An asterisk indicates a mark which assures the agreed level of surveillance.						



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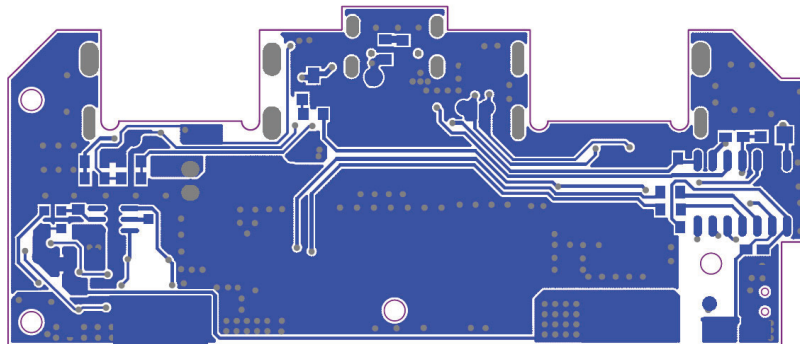
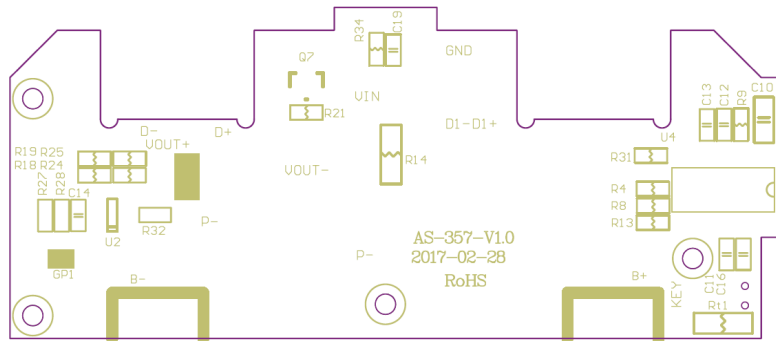
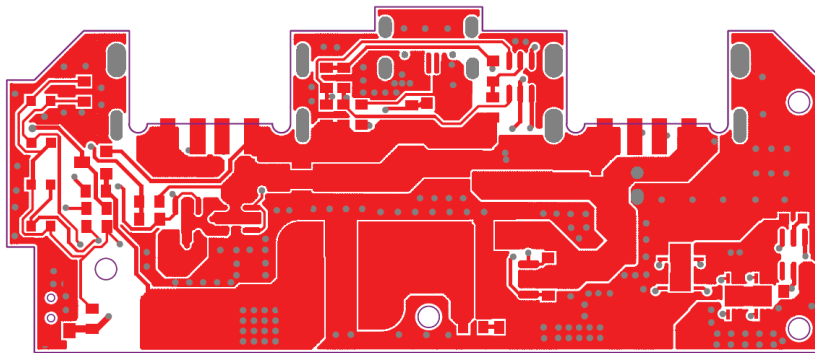
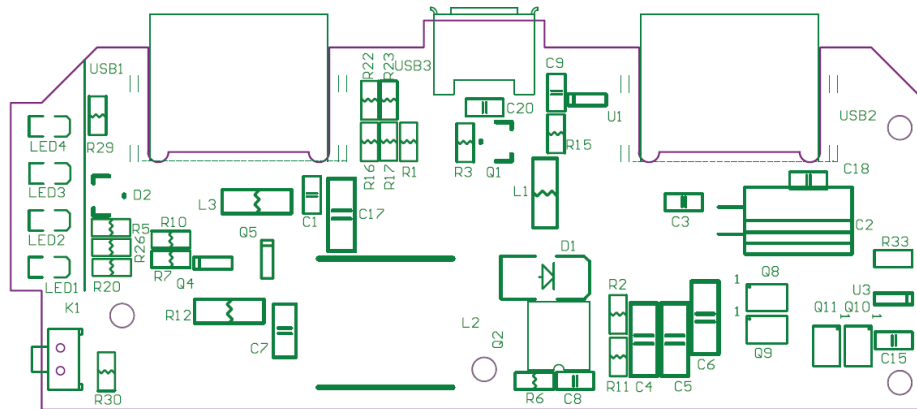
Circuit and layout drawing:

TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾
Plastic Material List:					
PCB	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	ILM-R1	Min. V-0, 130°C	UL 94	UL recognized
-Alt.	KINGBOARD LAMINATES HOLDINGS LTD	KB-6160	Min. V-0, 130°C	UL 94	UL recognized
-Alt.	JIANGSU SUNYUAN AEROSPACE MATERIAL CO.,LTD	V-66	94 V-0, 130°C	UL 94	UL recognized
-Alt.	interchangeable	interchangeable	Min. V-1, 130°C	UL 94	UL recognized
Plastic enclosure (top and bottom cover)	SABIC INNOVATIVE PLASTICS US LLC	C6200(GG)	V-0, 75 °C min. 1.5 mm thickness	UL 94	UL recognized
Note: 2) An asterisk indicates a mark which assures the agreed level of surveillance.					



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PCB Layout Drawing





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Photo

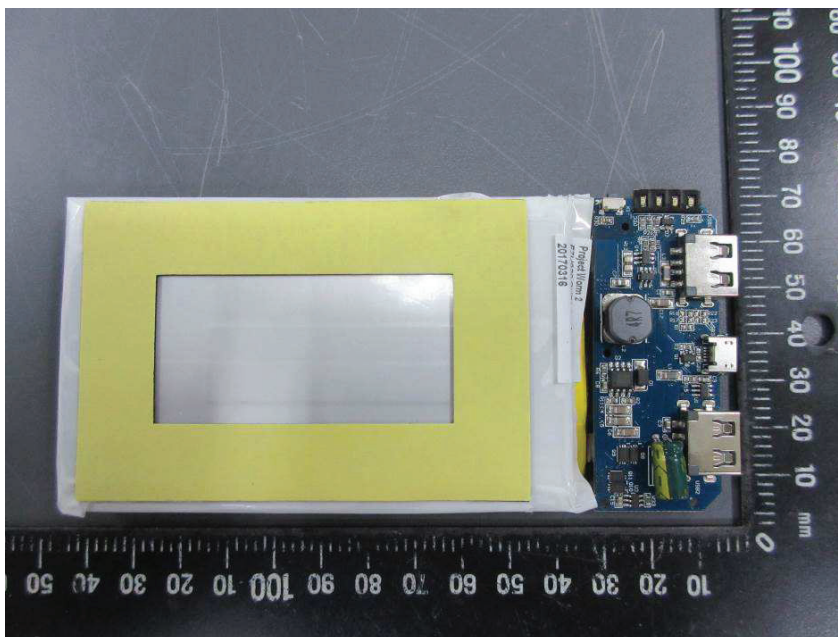
External view of EUT





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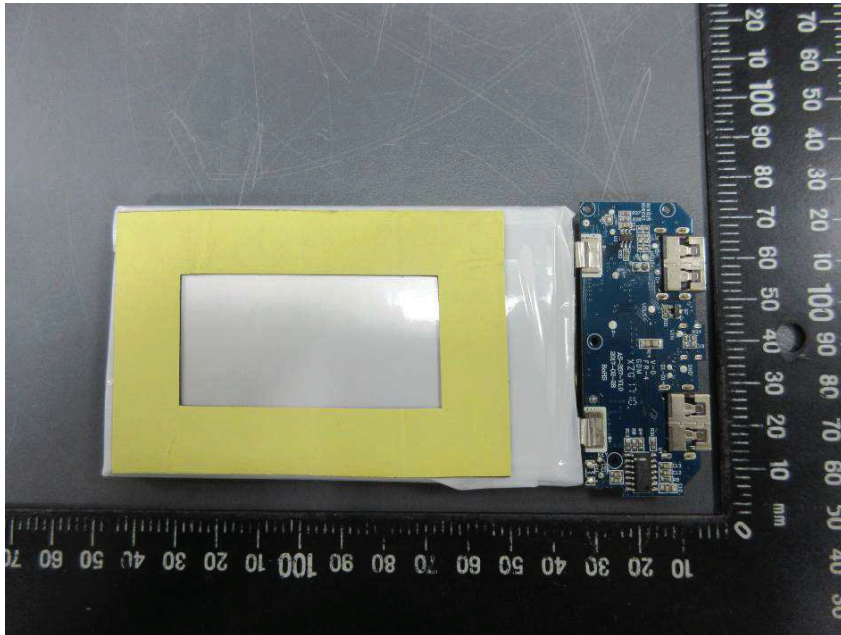
Internal view of Model F7U020



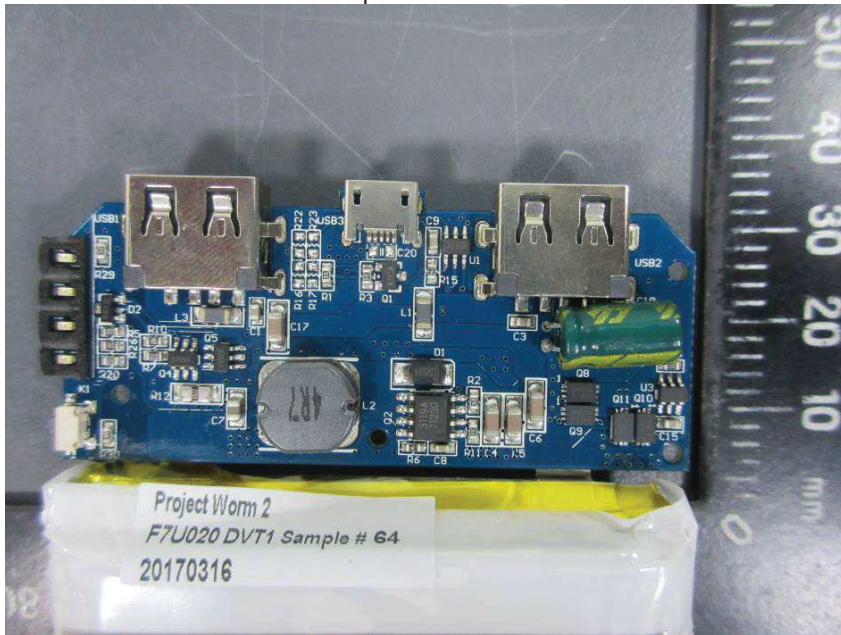


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Internal view of Model F7U020



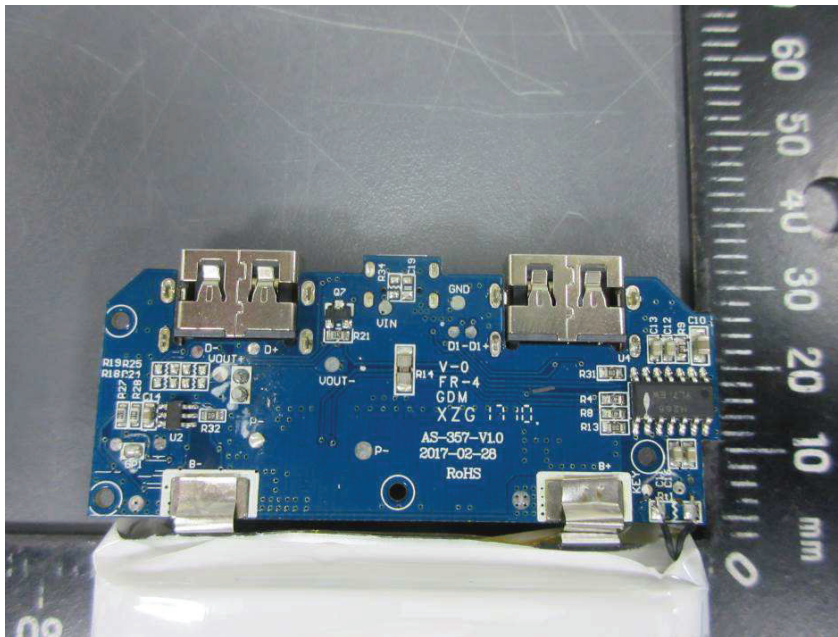
Top view of PCB





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Bottom view of PCB



From: Rajesh Karki
Sent: Monday, October 16, 2017 7:23 PM PDT
To: Nick Kalra
Subject: FW: Worm 1, 2 and 3 IEC 62368-1 test report
Attachments: 170800124TWN-001_CCA IEC 62368-1.pdf, 170800125TWN-001 IEC 62368-1.pdf,
RE F7U021, status tracker from ITS.msg

Attached is the test report is for Worm 1 and 2. Please see attached table 5.4.1.4, 6.3.2, 9.0, B.2.6 Temperature measurements.

For Worm 3 – See attached email.

Thanks
Rajesh

From: Jay Tu
Sent: Monday, October 16, 2017 7:16 PM
To: Rajesh Karki <Rajesh.Karki@belkin.com>
Subject: RE: Worm 1, 2 and 3 IEC 62368-1 test report

Hi Rajesh,

Please see the attachment.

Thanks.

Best Regards

Jay Tu
Regulatory Compliance Engineer

Belkin

O 310 751 5559
M +886 925 445 446

  
belkin.com

From: Rajesh Karki
Sent: Tuesday, October 17, 2017 10:12 AM
To: Jay Tu <Jay.Tu@belkin.com>
Subject: Worm 1, 2 and 3 IEC 62368-1 test report

Hi Jay,

Can you please send me the test reports for IEC 62368-1 for Worm 1, 2 and 3.

I checked my emails and was unable to find it in my emails. We need to provide to PMs asap so can you please check if you have it.

If not than I will checkup the backup of my old laptop tomorrow.

Thanks

RAJESH KARKI

Principal Regulatory Compliance Engineer

Belkin International

O [+1 310 751 2817](tel:+13107512817)

M [+1 949 735 9726](tel:+19497359726)

Skype: karki.rajesh



Test Report issued under the responsibility of:

intertek

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TEST REPORT IEC 62368-1 Audio/video, information and communication technology equipment Part 1: Safety requirements	
Report Number	170800124TWN-001
Date of issue	August 1, 2017
Total number of pages	64 pages test report + Appendix 1, 12 pages + Appendix 2, 2 pages + Photos, 4 pages.
Applicant's name	Belkin International Inc.
Address	12045 East Waterfront Drive, Playa Vista, CA 90094, USA
Test specification:	
Standard	IEC 62368-1:2014 (Second Edition) _ modified
Test procedure	Test Report
Non-standard test method	N/A
Test Report Form No.	-
Test Report Form(s) Originator	-
Master TRF	-
General disclaimer:	
The test results presented in this report relate only to the object tested.	
<small>Except where explicitly agreed in writing, all work and services performed by Intertek is subject to our standard Terms and Conditions which can be obtained at our website: http://www.intertek-twn.com/terms/ . Intertek's responsibility and liability are limited to the terms and conditions of the agreement.</small>	
<small>This report is made solely on the basis of your instructions and / or information and materials supplied by you and provide no warranty on the tested sample(s) be truly representative of the sample source. The report is not intended to be a recommendation for any particular course of action, you are responsible for acting as you see fit on the basis of the report results. Intertek is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received and accepts no responsibility to any parties whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works. This report does not discharge or release you from your legal obligations and duties to any other person. You are the only one authorized to permit copying or distribution of this report (and then only in its entirety). Any such third parties to whom this report may be circulated rely on the content of the report solely at their own risk.</small>	



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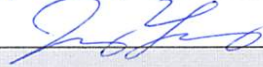
Test Item description	Rechargeable Li-Ion Battery Pack
Trade Mark	belkin
Manufacturer	Belkin International Inc. 12045 East Waterfront Drive, Playa Vista, CA 90094, USA
Model/Type reference	F7U020
Ratings	Input: 5 Vdc, 2 A, Output: 5 Vdc, 2.4A, 6070 mAh (each port 2.4 A max) Class III



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Testing procedure and testing location:		
<input checked="" type="checkbox"/>	Testing Laboratory:	Intertek Testing Services Taiwan Ltd.
Testing location/ address		5F, No. 423, Ruiguang Rd., Neihu District, Taipei 114, Taiwan
Tested by (name + signature)..... :		Mark Chou 
Approved by (name + signature)		Jacky Yang 



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List of Attachments (including a total number of pages in each attachment):

Appendix 1 (12 pages) – National Differences

Appendix 2 (2 pages) –Circuit and Layout drawing

Photos (4 pages)

Summary of testing:**Tests performed (name of test and test clause):**

4.6.2 10 N steady force test
 5.4.1.4, 6.3.2, 9.0, B.2.6 Temperature measurements
 6.2.2 Electrical power sources (PS) measurements for classification
 6.2.3.2 Determination of potential ignition sources (resistive PIS)
 B.2.5 Input test
 B.3 Simulated abnormal operating conditions
 B.4 Simulated single fault conditions
 F.3.10 Marking durability test
 M.3, M.4 Batteries test
 Q.1 Limited power source test
 T.3 Steady force test – 30 N
 T.4 Steady force test – 100 N
 T.7 Drop test
 T.8 Stress relief Test

Testing location:

Intertek Testing Services Taiwan Ltd.



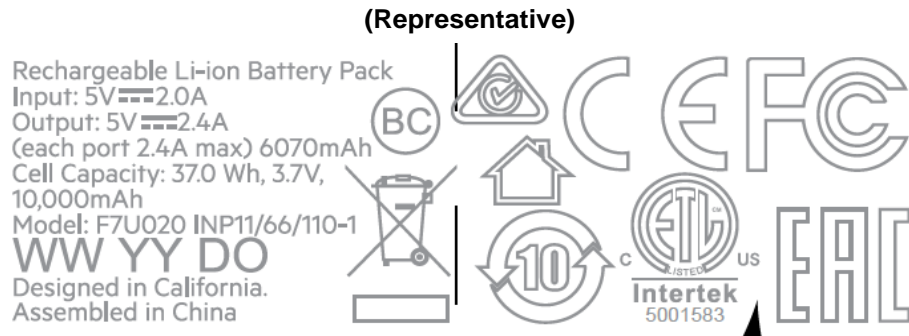
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Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

**Note:**

1. The above markings are the minimum requirements required by the safety standard. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.



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TEST ITEM PARTICULARS:	
Classification of use by	<input checked="" type="checkbox"/> Ordinary person <input type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person <input type="checkbox"/> Children likely to be present
Supply Connection.....	<input type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input checked="" type="checkbox"/> External Circuit - not Mains connected - <input checked="" type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Supply % Tolerance	<input type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +____%/ -____% <input checked="" type="checkbox"/> None
Supply Connection – Type	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> mating connector <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input checked="" type="checkbox"/> other: not directly connected to the mains
Considered current rating of protective device as part of building or equipment installation	N/A; Installation location: <input type="checkbox"/> building; <input type="checkbox"/> equipment
Equipment mobility	<input checked="" type="checkbox"/> movable <input type="checkbox"/> hand-held <input checked="" type="checkbox"/> transportable <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in <input type="checkbox"/> rack-mounting <input type="checkbox"/> wall-mounted
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input checked="" type="checkbox"/> other: Not direct connected to the mains
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III
Access location	<input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> N/A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input checked="" type="checkbox"/> PD 3
Manufacturer's specified maximum operating ambient:	40 °C for charge conditions; 40 °C for discharge conditions
IP protection class	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP____
Power Systems	<input type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - ____ V _{L-L}
Altitude during operation (m)	<input type="checkbox"/> 2000 m or less <input checked="" type="checkbox"/> 5000 m
Altitude of test laboratory (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> ____ m
Mass of equipment (g)	<input checked="" type="checkbox"/> Approx. 222.77 g

IEC62368_1B modified

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POSSIBLE TEST CASE VERDICTS:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement	F (Fail)
TESTING:	
Date of receipt of test item.....:	April 10, 2017
Date (s) of performance of tests	April 26, 2017 – July 4, 2017



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GENERAL REMARKS:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p> <p>This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.</p> <p>When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60068-2-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	1. SHENZHEN DBK ELECTRONICS CO., LTD 1st-5th floor Building 1, Jinyuan company Longhua Industrial Park, the north of Longguan Rd Hualian Community, Longhua Town, 518109 Baoan District, ShenZhen, Guangdong, China 518109



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GENERAL PRODUCT INFORMATION:**Product Description –**

The tested product is a Rechargeable Li-Ion Battery Pack for use in a general environment and the equipment is considered as transportable and Class III equipment.

The EUT has one micro USB input port and two USB output ports.

The Rechargeable Li-Ion Battery Pack, model F7U020, is equipped with one cell (1S1P) and the capacity is 6070 mAh.

The enclosures are fixed together by mechanical fixing.

The product was submitted and evaluated for the manufacturer's recommended maximum ambient (T_{mra}) 40°C for charge and discharge 40°C conditions.

The charging / discharging specification are listed as below:

Maximum Continue Charging Voltage/ Current: 5.25 Vdc / 2 A

Maximum Continue Discharge Current or Power: 2.4 A(USB1 output or USB 2 output or USB1+USB2 output)

Model Differences –

N/A

Additional application considerations – (Considerations used to test a component or sub-assembly) –

- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	FI	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI

Indicate used abbreviations (if any)



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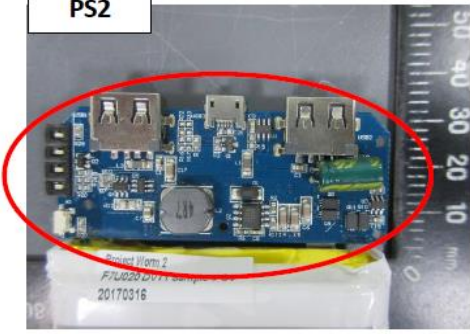

Report No. 170800124TWN-001

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)	
Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input	
ES1	
Source of electrical energy	Corresponding classification (ES)
Cells output (1S1P)	ES1
Power bank USB output	ES1
+5 V dc micro USB input	ES1
Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts):	
PS2	
Source of power or PIS	Corresponding classification (PS)
Cells output (1S1P)	PS2
Power bank USB output	PS2 (Comply with Clause Q.1)
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component	
Glycol	
Source of hazardous substances	Corresponding chemical
Rechargeable Li-polymer cell	Li-ion
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit	
MS2	
Source of kinetic/mechanical energy	Corresponding classification (MS)
Equipment mass	MS1
Sharp edge and corner	MS1
Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure	
TS1	
Source of thermal energy	Corresponding classification (TS)
External plastic enclosure	TS2
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product	
RS1	
Type of radiation	Corresponding classification (RS)
Indicating lights – LEDs	RS1

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ENERGY SOURCE DIAGRAM	
Indicate which energy sources are included in the energy source diagram. Insert diagram below	
<div><input checked="" type="checkbox"/> ES <input checked="" type="checkbox"/> PS <input type="checkbox"/> MS <input checked="" type="checkbox"/> TS <input type="checkbox"/> RS</div> <div><div><div>ES1</div></div><div><div>PS2</div></div><div><div>TS2</div></div></div>	



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OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	Possible Hazard			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	ES1: Battery circuit	N/A	N/A	N/A
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Plastic enclosure	PS2: <100 Watt circuit	Comply with Clause 6.3	Fire enclosure	N/A
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary person	Hazardous material (cell)	N/A	N/A	Enclosure
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary person	MS1: Mass ≤ 7 kg	N/A	N/A	N/A
Ordinary person	MS1: Sharp edges and corners	N/A	N/A	N/A
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS2: All accessible parts	Need to provide Instructional safeguard complies with 9.4.2	N/A	N/A
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	RS1: Indicating lights	N/A	N/A	N/A
Supplementary Information:				
1) See attached energy source diagram for additional details.				
2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault				

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Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies	(see appended tables 4.1.2)	P
4.1.2	Use of components	Components, which are certified to IEC and/or national standards, are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment	P
4.1.3	Equipment design and construction	Considered	P
4.1.15	Markings and instructions.....:	(See Annex F)	P
4.4.4	Safeguard robustness	All safeguards comply with the relevant robustness tests and requirement	P
4.4.4.2	Steady force tests.....:	(See Annex T.3, T.4, T.7 and T.8)	P
4.4.4.3	Drop tests.....:	(See Annex T.7)	P
4.4.4.4	Impact tests.....:		N/A
4.4.4.5	Internal accessible safeguard enclosure and barrier tests.....:		N/A
4.4.4.6	Glass Impact tests.....:		N/A
4.4.4.7	Thermoplastic material tests.....:	(See Annex T.8)	P
4.4.4.8	Air comprising a safeguard.....:	No such type safeguard provided	N/A
4.4.4.9	Accessibility and safeguard effectiveness	During and after the tests, the EUT still complies with the relevant requirement of this standard	P
4.5	Explosion	No explosion occurs	P
4.6	Fixing of conductors	See below	P
4.6.1	Fix conductors not to defeat a safeguard	No conductors defeat a safeguard	P
4.6.2	10 N force test applied to.....:	Conductive tab terminals of internal cell	P
4.7	Equipment for direct insertion into mains socket - outlets	The EUT is not such type equipment	N/A
4.7.2	Mains plug part complies with the relevant standard.....:		N/A
4.7.3	Torque (Nm).....:		N/A
4.8	Products containing coin/button cell batteries	No lithium coin or button cell batteries within the EUT	N/A
4.8.2	Instructional safeguard		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.8.3	Battery Compartment Construction		N/A
	Means to reduce the possibility of children removing the battery		—
4.8.4	Battery Compartment Mechanical Tests		N/A
4.8.5	Battery Accessibility		N/A
4.9	Likelihood of fire or shock due to entry of conductive object	No opening on the EUT	P

5	ELECTRICALLY-CAUSED INJURY		P
5.2.1	Electrical energy source classifications	The EUT is a Class III battery pack and considered as ES1 only	P
5.2.2	ES1, ES2 and ES3 limits	Considered	P
5.2.2.2	Steady-state voltage and current	The EUT is a Class III battery pack and considered as ES1 only	P
5.2.2.3	Capacitance limits		N/A
5.2.2.4	Single pulse limits		N/A
5.2.2.5	Limits for repetitive pulses		N/A
5.2.2.6	Ringling signals	No such ringing signal within the EUT	N/A
5.2.2.7	Audio signals	No audio amplifier within the EUT	N/A
5.3	Protection against electrical energy sources	See below	P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	The EUT is a Class III equipment and considered as ES1 only. No safeguard is required.	P
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
5.3.2.2	Contact requirements		N/A
	a) Test with test probe from Annex V		N/A
	b) Electric strength test potential (V)		N/A
	c) Air gap (mm)		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material	No hygroscopic materials used as insulation. Only Functional Insulation is considered and complied with Annex B.4.4	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.3	Humidity conditioning	The EUT is a Class III equipment and considered as ES1 only	N/A
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table 5.4.1.4)	P
5.4.1.5	Pollution degree	2	—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling		N/A
5.4.1.6	Insulation in transformers with varying dimensions	No such transformer within the EUT	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such device within the EUT	N/A
5.4.1.8	Determination of working voltage		N/A
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat softening temperature		N/A
5.4.1.10.3	Ball pressure		N/A
5.4.2	Clearances	Only Functional Insulation is considered and complied with Annex B.4.4	N/A
5.4.2.2	Determining clearance using peak working voltage		N/A
5.4.2.3	Determining clearance using required withstand voltage		N/A
	a) a.c. mains transient voltage		—
	b) d.c. mains transient voltage		—
	c) external circuit transient voltage		—
	d) transient voltage determined by measurement		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test		N/A
5.4.2.5	Multiplication factors for clearances and test voltages		N/A
5.4.3	Creepage distances	Only Functional Insulation is considered and complied with Annex B.4.4	N/A
5.4.3.1	General		N/A
5.4.3.3	Material Group		—
5.4.4	Solid insulation		N/A
5.4.4.2	Minimum distance through insulation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.3	Insulation compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs)		N/A
5.4.4.6.3	Non-separable thin sheet material	No such device within the EUT	N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material	No such device within the EUT	N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
	Insulation resistance (MΩ).....		—
5.4.6	Insulation of internal wire as part of supplementary safeguard	No such insulation of internal wire as part of supplementary insulation	N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%).....		—
	Temperature (°C)		—
	Duration (h)		—
5.4.9	Electric strength test		N/A
5.4.9.1	Test procedure for a solid insulation type test		N/A
5.4.9.2	Test procedure for routine tests		N/A
5.4.10	Protection against transient voltages between external circuit	Not connected to such external circuit	N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test		N/A
5.4.10.2.3	Steady-state test.....		N/A

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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.11	Insulation between external circuits and earthed circuitry		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	Rated operating voltage U_{op} (V)		—
	Nominal voltage U_{peak} (V)		—
	Max increase due to variation U_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
	$U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$		—
5.5	Components as safeguards		
5.5.1	General	See below	N/A
5.5.2	Capacitors and RC units	No such devices used as safeguard	N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector		N/A
5.5.3	Transformers		N/A
5.5.4	Optocouplers		N/A
5.5.5	Relays		N/A
5.5.6	Resistors		N/A
5.5.7	SPD's	No such component within the EUT	N/A
5.5.7.1	Use of an SPD connected to reliable earthing		N/A
5.5.7.2	Use of an SPD between mains and protective earth		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable	No antenna terminal within the EUT	N/A
5.6	Protective conductor		
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors	No power cord provided	N/A
	Protective earthing conductor size (mm^2)		—
5.6.4	Requirement for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm^2)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Protective current rating (A)		—
5.6.4.3	Current limiting and overcurrent protective devices		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Requirement		N/A
	Conductor size (mm ²), nominal thread diameter (mm)		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method Resistance (Ω).....		N/A
5.6.7	Reliable earthing		N/A
5.7	Prospective touch voltage, touch current and protective conductor current		N/A
5.7.2	Measuring devices and networks	The EUT is a Class III equipment and considered as ES1 only.	N/A
5.7.2.1	Measurement of touch current		N/A
5.7.2.2	Measurement of prospective touch voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
	System of interconnected equipment (separate connections/single connection)		—
	Multiple connections to mains (one connection at a time/simultaneous connections)		—
5.7.4	Earthed conductive accessible parts		N/A
5.7.5	Protective conductor current		N/A
	Supply Voltage (V).....		—
	Measured current (mA).....		—
	Instructional Safeguard.....		N/A
5.7.6	Prospective touch voltage and touch current due to external circuits	Not connected to a coaxial cable	N/A
5.7.6.1	Touch current from coaxial cables		N/A
5.7.6.2	Prospective touch voltage and touch current to external circuits		N/A
5.7.7	Summation of touch currents from external circuits	Not such device	N/A
	a) Equipment with earthed external circuits Measured current (mA).....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA)		N/A

6	ELECTRICALLY- CAUSED FIRE		P
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		P
6.2.2	Power source circuit classifications	See below	P
6.2.2.1	General		P
6.2.2.2	Power measurement for worst-case load fault ... :	(See appended table 6.2.2)	P
6.2.2.3	Power measurement for worst-case power source fault	(See appended table 6.2.2)	P
6.2.2.4	PS1	(See appended table 6.2.2)	P
6.2.2.5	PS2	(See appended table 6.2.2)	P
6.2.2.6	PS3		N/A
6.2.3	Classification of potential ignition sources	See below	P
6.2.3.1	Arcing PIS	No arcing PIS within the EUT	N/A
6.2.3.2	Resistive PIS	The EUT is considered as a resistive PIS under single fault condition (see table 6.2.3.2). The fire enclosure is also provided.	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials	(See appended table 5.4.1.5, 6.3.2, 9.0, B.2.6)	P
6.3.1 (b)	Combustible materials outside fire enclosure	No combustible materials on outside fire enclosure	N/A
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method	Control fire spread (also see sub-clause 6.4.4, 6.4.5, 6.4.6)	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		N/A
6.4.3.1	General		N/A
6.4.3.2	Supplementary Safeguards		N/A
	Special conditions if conductors on printed boards are opened or peeled		N/A
6.4.3.3	Single Fault Conditions		N/A
	Special conditions for temperature limited by fuse		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.4	Control of fire spread in PS1 circuits	No supplementary safeguards are needed	P
6.4.5	Control of fire spread in PS2 circuits	Considered	P
6.4.5.2	Supplementary safeguards	Components and materials have adequate flammability classification (See appended tables 4.1.2 and Annex G)	P
6.4.6	Control of fire spread in PS3 circuit	No PS3 circuits within the EUT	N/A
6.4.7	Separation of combustible materials from a PIS	See below	P
6.4.7.1	General	See below	P
6.4.7.2	Separation by distance	Considered and PCB is min. V-1.	P
6.4.7.3	Separation by a fire barrier	No such parts	N/A
6.4.8	Fire enclosures and fire barriers		P
6.4.8.1	Fire enclosure and fire barrier material properties		P
6.4.8.2.1	Requirements for a fire barrier	No such parts	N/A
6.4.8.2.2	Requirements for a fire enclosure	Fire enclosure is provided	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier	Considered	P
6.4.8.3.1	Fire enclosure and fire barrier openings	No openings on the fire enclosure	N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm)		N/A
	Needle Flame test		N/A
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm)		N/A
	Flammability tests for the bottom of a fire enclosure		N/A
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c)	No such door or cover.	N/A
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating	The fire enclosure is made of V-0 class material	P
6.5	Internal and external wiring		N/A
6.5.1	Requirements		N/A
6.5.2	Cross-sectional area (mm ²)		—
6.5.3	Requirements for interconnection to building wiring		N/A
6.6	Safeguards against fire due to connection to additional equipment		P

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Clause	Requirement + Test	Result - Remark	Verdict
	External port limited to PS2 or complies with Clause Q.1	All I/O ports comply with Annex Q.1	P

7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		P
7.2	Reduction of exposure to hazardous substances	Checked	P
7.3	Ozone exposure	No ozone produced.	N/A
7.4	Use of personal safeguards (PPE)		N/A
	Personal safeguards and instructions		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010)		—
7.6	Batteries.....	(See Annex M)	P

8	MECHANICALLY-CAUSED INJURY		P
8.1	General	See below	P
8.2	Mechanical energy source classifications	Sharp edges and corners: MS1; Equipment mass: MS1	P
8.3	Safeguards against mechanical energy sources	Considered	P
8.4	Safeguards against parts with sharp edges and corners	The outer surface of the EUT is smoothed. No sharp edges and corners	P
8.4.1	Safeguards	Not required	N/A
8.5	Safeguards against moving parts		N/A
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
8.5.2	Instructional Safeguard	Not required	—
8.5.4	Special categories of equipment comprising moving parts	No such device within the EUT	N/A
8.5.4.1	Large data storage equipment		N/A
8.5.4.2	Equipment having electromechanical device for destruction of media		N/A
8.5.4.2.1	Safeguards and Safety Interlocks		N/A
8.5.4.2.2	Instructional safeguards against moving parts		N/A
	Instructional Safeguard		—
8.5.4.2.3	Disconnection from the supply		N/A
8.5.4.2.4	Probe type and force (N)		N/A
8.5.5	High Pressure Lamps	No high pressure lamps.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.1	Energy Source Classification		N/A
8.5.5.2	High Pressure Lamp Explosion Test.....:		N/A
8.6	Stability	The mass of EUT is MS1	P
8.6.1	Product classification	No stability requirements	P
	Instructional Safeguard.....:	Not required	—
8.6.2	Static stability		N/A
8.6.2.2	Static stability test		N/A
	Applied Force.....:		—
8.6.2.3	Downward Force Test		N/A
8.6.3	Relocation stability test		N/A
	Unit configuration during 10° tilt.....:		—
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test (Applied Force).....:		N/A
	Position of feet or movable parts.....:		—
8.7	Equipment mounted to wall or ceiling	The EUT is not such equipment	N/A
8.7.1	Mounting Means (Length of screws (mm) and mounting surface).....:		N/A
8.7.2	Direction and applied force.....:		N/A
8.8	Handles strength	No such device within the EUT	N/A
8.8.1	Classification		N/A
8.8.2	Applied Force.....:		N/A
8.9	Wheels or casters attachment requirements	No such device within the EUT	N/A
8.9.1	Classification		N/A
8.9.2	Applied force.....:		—
8.10	Carts, stands and similar carriers	No such device within the EUT	N/A
8.10.1	General		N/A
8.10.2	Marking and instructions		N/A
	Instructional Safeguard.....:		—
8.10.3	Cart, stand or carrier loading test and compliance		N/A
	Applied force.....:		—
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Applied horizontal force (N).....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
8.10.6	Thermoplastic temperature stability (°C).....:		N/A
8.11	Mounting means for rack mounted equipment	No such device	N/A
8.11.1	General		N/A
8.11.2	Product Classification		N/A
8.11.3	Mechanical strength test, variable N		N/A
8.11.4	Mechanical strength test 250N, including end stops		N/A
8.12	Telescoping or rod antennas	No such device	N/A
	Button/Ball diameter (mm).....:		—

9	THERMAL BURN INJURY		—
9.2	Thermal energy source classifications	After reviewing, accessible parts are classified TS2, can't be classified TS1	—
9.3	Safeguard against thermal energy sources	After reviewing, accessible parts are classified TS2, can't be classified TS1	—
9.4	Requirements for safeguards		—
9.4.1	Equipment safeguard	(See appended table B.3 & B.4)	—
9.4.2	Instructional safeguard	Need to provide Instructional safeguard	—

10	RADIATION		P
10.2	Radiation energy source classification	See below	P
10.2.1	General classification	Indicating LEDs	P
10.3	Protection against laser radiation	The EUT does not produce laser radiation	N/A
	Laser radiation that exists equipment:		—
	Normal, abnormal, single-fault.....:		N/A
	Instructional safeguard		—
	Tool.....:		—
10.4	Protection against visible, infrared, and UV radiation	The EUT does not produce significant visible, infrared and UV radiation	N/A
10.4.1	General		N/A
10.4.1.a)	RS3 for Ordinary and instructed persons		N/A
10.4.1.b)	RS3 accessible to a skilled person.....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Personal safeguard (PPE) instructional safeguard..... :		—
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1 . :		N/A
10.4.1.d)	Normal, abnormal, single-fault conditions :		N/A
10.4.1.e)	Enclosure material employed as safeguard is opaque..... :		N/A
10.4.1.f)	UV attenuation..... :		N/A
10.4.1.g)	Materials resistant to degradation UV :		N/A
10.4.1.h)	Enclosure containment of optical radiation..... :		N/A
10.4.1.i)	Exempt Group under normal operating conditions..... :		N/A
10.4.2	Instructional safeguard :		N/A
10.5	Protection against x-radiation	The EUT does not produce x-radiation	N/A
10.5.1	X- radiation energy source that exists equipment : Normal, abnormal, single fault conditions		N/A
	Equipment safeguards..... :		N/A
	Instructional safeguard for skilled person :		N/A
10.5.3	Most unfavourable supply voltage to give maximum radiation :		—
	Abnormal and single-fault condition :		N/A
	Maximum radiation (pA/kg)..... :		N/A
10.6	Protection against acoustic energy sources	No such device.	N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output, dB(A) :		N/A
	Output voltage, unweighted r.m.s..... :		N/A
10.6.4	Protection of persons		N/A
	Instructional safeguards :		N/A
	Equipment safeguard prevent ordinary person to RS2..... :		—
	Means to actively inform user of increase sound pressure..... :		—
	Equipment safeguard prevent ordinary person to RS2..... :		—
10.6.5	Requirements for listening devices (headphones, earphones, etc.)	No such device within the EUT	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.5.1	Corded passive listening devices with analog input		N/A
	Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output..... :		—
10.6.5.2	Corded listening devices with digital input		N/A
	Maximum dB(A)..... :		—
10.6.5.3	Cordless listening device		N/A
	Maximum dB(A)..... :		—

B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		P
B.2	Normal Operating Conditions	See below	P
B.2.1	General requirements..... :	(See appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers :	No such component within the EUT (See Annex E)	N/A
B.2.3	Supply voltage and tolerances	Input: 5 Vdc, 2 A	P
B.2.5	Input test..... :	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General requirements..... :	See below	P
B.3.2	Covering of ventilation openings	No openings	N/A
B.3.3	D.C. mains polarity test	Not connected to DC mains	N/A
B.3.4	Setting of voltage selector :	No setting of voltage selector within the EUT	N/A
B.3.5	Maximum load at output terminals :	Considered	P
B.3.6	Reverse battery polarity	The reverse polarity installation is prevented by construction	P
B.3.7	Abnormal operating conditions as specified in Clause E.2.	No audio amplifier within the EUT	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions	All safeguards remain effective	P
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited :	Approved NTC device has been provided	P
B.4.3	Motor tests		N/A
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature :		N/A
B.4.4	Short circuit of functional insulation	See below	P

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.4.1	Short circuit of clearances for functional insulation	(See appended table B.4)	P
B.4.4.2	Short circuit of creepage distances for functional insulation	(See appended table B.4)	P
B.4.4.3	Short circuit of functional insulation on coated printed boards	No coated printed boards within the EUT	N/A
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors	(See appended table B.4)	P
B.4.6	Short circuit or disconnect of passive components	(See appended table B.4)	P
B.4.7	Continuous operation of components	No such component intended for short time operation or intermittent operation	N/A
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions		P
B.4.9	Battery charging under single fault conditions ... :	(See Annex M)	P
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation	The EUT does not produce UV radiation	N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure apparatus		N/A
C.2.4	Xenon-arc light exposure apparatus		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators	No such device within the EUT	N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N/A
E.1	Audio amplifier normal operating conditions	No audio amplifier within the EUT	N/A
	Audio signal voltage (V)		—
	Rated load impedance (Ω)		—
E.2	Audio amplifier abnormal operating conditions	(See appended table B.3 & B.4)	N/A
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		P
F.1	General requirements		P

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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Instructions – Language	English. However, the local language for each country that would be marketed shall be provided	—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1	Letter symbols are used according to IEC 60027-1	P
F.2.2	Graphic symbols IEC, ISO or manufacturer specific	Graphic symbols are used according to IEC 60417-1 or ISO 3864-2 or ISO 7000	P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	Marking is on enclosure which is not removable part	P
F.3.2	Equipment identification markings	See below	P
F.3.2.1	Manufacturer identification	belkin	—
F.3.2.2	Model identification	F7U020	—
F.3.3	Equipment rating markings	See below	P
F.3.3.1	Equipment with direct connection to mains		N/A
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of supply voltage.....	===	—
F.3.3.4	Rated voltage	Input: 5 Vdc, 2 A, Output: 5 Vdc, 2.4 A	—
F.3.3.4	Rated frequency		—
F.3.3.6	Rated current or rated power	Input: 5 Vdc, 2 A, Output: 5 Vdc, 2.4 A	—
F.3.3.7	Equipment with multiple supply connections	The EUT is not such type equipment	N/A
F.3.4	Voltage setting device	Only one power supply voltage, no voltage setting within the EUT	N/A
F.3.5	Terminals and operating devices	See below	N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings.....	No such component within the EUT	N/A
F.3.5.2	Switch position identification marking	No such marking used	N/A
F.3.5.3	Replacement fuse identification and rating markings.....	No such component within the EUT	N/A
F.3.5.4	Replacement battery identification marking	Battery can't be replaced by user	N/A
F.3.5.5	Terminal marking location	No such component within the EUT	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.6	Equipment markings related to equipment classification	See below	P
F.3.6.1	Class I Equipment	The EUT is a Class III equipment	N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Neutral conductor terminal	Not permanently connected equipment	N/A
F.3.6.1.3	Protective bonding conductor terminals	Evaluated at approved power supply	N/A
F.3.6.2	Class II equipment (IEC60417-5172)	The EUT is a Class III equipment	N/A
F.3.6.2.1	Class II equipment with or without functional earth		N/A
F.3.6.2.2	Class II equipment with functional earth terminal marking		N/A
F.3.7	Equipment IP rating marking	IPX0	—
F.3.8	External power supply output marking	Class III equipment	N/A
F.3.9	Durability, legibility and permanence of marking	The marking on the EUT is durable and legible	P
F.3.10	Test for permanence of markings	After rubbing test by water and petroleum spirit, the marking is still legible; it is not easily removed .	P
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking	The EUT is not such type equipment	N/A
	b) Instructions given for installation or initial use	Need to be further evaluated	—
	c) Equipment intended to be fastened in place	The EUT is not such type equipment	N/A
	d) Equipment intended for use only in restricted access area	The EUT is not such type equipment	N/A
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1	No such terminals	N/A
	f) Protective earthing employed as safeguard	Class III equipment	N/A
	g) Protective earthing conductor current exceeding ES 2 limits		N/A
	h) Symbols used on equipment	Need to be further evaluated	—
	i) Permanently connected equipment not provided with all-pole mains switch	The EUT is not a permanently connected equipment	N/A
	j) Replaceable components or modules providing safeguard function	No replaceable components or modules within EUT	N/A
F.5	Instructional safeguards		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction	Need to be further evaluated	—
G	COMPONENTS		P
G.1	Switches		N/A
G.1.1	General requirements	No switch is used	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.2	Relays		N/A
G.2.1	General requirements	No such devices within the EUT	N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supply power		N/A
G.2.4	Mains relay, modified as stated in G.2		N/A
G.3	Protection Devices		P
G.3.1	Thermal cut-offs	No such devices within the EUT	N/A
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Thermal cut-off connections maintained and secure		N/A
G.3.2	Thermal links		N/A
G.3.2.1a)	Thermal links separately tested with IEC 60691	No such devices within the EUT	N/A
G.3.2.1b)	Thermal links tested as part of the equipment		N/A
	Aging hours (H)		—
	Single Fault Condition		—
	Test Voltage (V) and Insulation Resistance (Ω) :		—
G.3.3	PTC Thermistors	Approved thermistor is used	P
G.3.4	Overcurrent protection devices		N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions.....		N/A
G.4	Connectors		N/A
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration		N/A

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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	Wound Components		N/A
G.5.1	Wire insulation in wound components.....		N/A
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		N/A
G.5.1.2 b)	Construction subject to routine testing		N/A
G.5.2	Endurance test on wound components		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Time (s)		—
	Temperature (°C)		—
G.5.2.3	Wound Components supplied by mains		N/A
G.5.3	Transformers		N/A
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1).....		N/A
	Position.....		—
	Method of protection		—
G.5.3.2	Insulation		N/A
	Protection from displacement of windings.....		—
G.5.3.3	Overload test		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding Temperatures testing in the unit		N/A
G.5.3.3.3	Winding Temperatures - Alternative test method		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
	Position		—
G.5.4.2	Test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days)		—
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test (V)		—

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h)		N/A
	Electric strength test (V)		—
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature		N/A
	Electric strength test (V)		N/A
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h)		N/A
	Electric strength test (V)		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage		—
G.6	Wire Insulation		N/A
G.6.1	General	No such wire within the EUT	N/A
G.6.2	Solvent-based enamel wiring insulation		N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements		N/A
	Type.....		—
	Rated current (A)		—
	Cross-sectional area (mm ²), (AWG).....		—
G.7.2	Compliance and test method		N/A
G.7.3	Cord anchorages and strain relief for non- detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N)		—
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm)....		—
G.7.3.2.4	Strain relief comprised of polymeric material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A

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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.5.2	Mass (g)		—
	Diameter (m)		—
	Temperature (°C)		—
G.7.6	Supply wiring space		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Test with 8 mm strand		N/A
G.8	Varistors		N/A
G.8.1	General requirements		N/A
G.8.2	Safeguard against shock		N/A
G.8.3	Safeguard against fire		N/A
G.8.3.2	Varistor overload test		N/A
G.8.3.3	Temporary overvoltage		N/A
G.9	Integrated Circuit (IC) Current Limiters		N/A
G.9.1 a)	Manufacturer defines limit at max. 5A.	No such device within the EUT	N/A
G.9.1 b)	Limiters do not have manual operator or reset		N/A
G.9.1 c)	Supply source does not exceed 250 VA		—
G.9.1 d)	IC limiter output current (max. 5A)		—
G.9.1 e)	Manufacturers' defined drift		—
G.9.2	Test Program 1		N/A
G.9.3	Test Program 2		N/A
G.9.4	Test Program 3		N/A
G.10	Resistors		N/A
G.10.1	General requirements		N/A
G.10.2	Resistor test		N/A
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N/A
G.10.3.1	General requirements		N/A
G.10.3.2	Voltage surge test		N/A
G.10.3.3	Impulse test		N/A
G.11	Capacitor and RC units		N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A

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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.12	Optocouplers		N/A
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results)		N/A
	Type test voltage Vini		—
	Routine test voltage, Vini,b		—
G.13	Printed boards		N/A
G.13.1	General requirements	No requirement of insulation on printed boards within the EUT	N/A
G.13.2	Uncoated printed boards		N/A
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
	Compliance with cemented joint requirements (Specify construction)		—
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs)		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2a)	Thermal conditioning		N/A
G.13.6.2b)	Electric strength test		N/A
G.13.6.2c)	Abrasion resistance test		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements	(See G.13)	N/A
G.15	Liquid filled components		N/A
G.15.1	General requirements	No such devices within the EUT	N/A
G.15.2	Requirements		N/A
G.15.3	Compliance and test methods		N/A
G.15.3.1	Hydrostatic pressure test		N/A
G.15.3.2	Creep resistance test		N/A
G.15.3.3	Tubing and fittings compatibility test		N/A
G.15.3.4	Vibration test		N/A
G.15.3.5	Thermal cycling test		N/A
G.15.3.6	Force test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.15.4	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours	No such devices within the EUT	N/A
b)	Impulse test using circuit 2 with U_c = to transient voltage		N/A
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N/A
C2)	Test voltage		—
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N/A
D2)	Capacitance		—
D3)	Resistance		—
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General	No such devices within the EUT	N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz)		—
H.3.1.2	Voltage (V)		—
H.3.1.3	Cadence; time (s) and voltage (V)		—
H.3.1.4	Single fault current (mA):.....		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)		—
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		N/A
	General requirements		N/A
K	SAFETY INTERLOCKS		N/A
K.1	General requirements	No such devices within the EUT	N/A
K.2	Components of safety interlock safeguard mechanism		N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.5	Fail-safe		N/A
	Compliance		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Compliance and Test method		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location)		N/A
K.7.2	Overload test, Current (A)		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements		N/A
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources	No multiple power sources.	N/A
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		P
M.1	General requirements		P
M.2	Safety of batteries and their cells	Lithium cell is provided by IEC 62133	P
M.2.1	Requirements	Cells are approved	P
M.2.2	Compliance and test method (identify method) .. :	Checked by inspection and evaluation based on the relevant documents of cells.	P
M.3	Protection circuits	See below	P
M.3.1	Requirements	Considered	P
M.3.2	Tests		P
	- Overcharging of a rechargeable battery	See Annex M table	P
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Excessive discharging rate for any battery	See Annex M table	P
M.3.3	Compliance	Considered.	P
M.4	Additional safeguards for equipment containing secondary lithium battery		P
M.4.1	General		P
M.4.2	Charging safeguards	Considered	P
M.4.2.1	Charging operating limits	Considered	P
M.4.2.2a)	Charging voltage, current and temperature	See Annex M.4 table for details	—
M.4.2.2 b)	Single faults in charging circuitry	See Annex M.4 table for details	—
M.4.3	Fire Enclosure	The fire enclosure is made by V-0 class material	P
M.4.4	Endurance of equipment containing a secondary lithium battery	See below	P
M.4.4.2	Preparation	Two fully charged batteries has been prepared for test and reference	P
M.4.4.3	Drop and charge/discharge function tests	See below	P
	Drop	After the drop test, the voltage difference doesn't exceed 5% during 24 hours period	P
	Charge	After test, the charge function is still operated	P
	Discharge	After test, the discharge function is still operated	P
M.4.4.4	Charge-discharge cycle test	Three complete discharge and charge cycles have been performed	P
M.4.4.5	Result of charge-discharge cycle test	No fire or explosion is occurred during the test	P
M.5	Risk of burn due to short circuit during carrying	See below	P
M.5.1	Requirement	Battery terminal has been protected by enclosure structure	P
M.5.2	Compliance and Test Method (Test of P.2.3)	The enclosure is provided against the entry of foreign objects	N/A
M.6	Prevention of short circuits and protection from other effects of electric current		P
M.6.1	Short circuits	Considered	P
M.6.1.1	General requirements	The external short circuit has been simulated, and no fire, explosion	P

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Clause	Requirement + Test	Result - Remark	Verdict
M.6.1.2	Test method to simulate an internal fault	The force internal short circuit test of cell have been evaluated according to IEC 62133 requirement	P
M.6.1.3	Compliance (Specify M.6.1.2 or alternative method)	The sample does not explode or emit molten material during all of the tests	P
M.6.2	Leakage current (mA)		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
M.7.2	Compliance and test method		N/A
M.8	Protection against internal ignition from external spark sources of lead acid batteries	The EUT is not such type equipment	N/A
M.8.1	General requirements		N/A
M.8.2	Test method		N/A
M.8.2.1	General requirements		N/A
M.8.2.2	Estimation of hypothetical volume V_z (m ³ /s).....		—
M.8.2.3	Correction factors.....		—
M.8.2.4	Calculation of distance d (mm)		—
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing)	Considered	P
N	ELECTROCHEMICAL POTENTIALS		P
	Metal(s) used	Compliance	—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		N/A
	Figures O.1 to O.20 of this Annex applied		—
P	SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS		P
P.1	General requirements	See below	P
P.2.2	Safeguards against entry of foreign object	See below	P
	Location and Dimensions (mm)	No openings on EUT	—
P.2.3	Safeguard against the consequences of entry of foreign object		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
P.2.3.1	Safeguards against the entry of a foreign object		N/A
	Openings in transportable equipment	No openings on EUT	N/A
	Transportable equipment with metalized plastic parts		N/A
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard)	No openings on EUT	N/A
P.3	Safeguards against spillage of internal liquids	No such liquids within the EUT	N/A
P.3.1	General requirements		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Safeguards effectiveness		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
P.4.2 a)	Conditioning testing		N/A
	Tc (°C)		—
	Tr (°C)		—
	Ta (°C)		—
P.4.2 b)	Abrasion testing	(See G.13.6.2)	N/A
P.4.2 c)	Mechanical strength testing	(See Annex T)	N/A
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		P
Q.1	Limited power sources	See below	P
Q.1.1 a)	Inherently limited output		P
Q.1.1 b)	Impedance limited output		N/A
	- Regulating network limited output under normal operating and simulated single fault condition		N/A
Q.1.1 c)	Overcurrent protective device limited output		N/A
Q.1.1 d)	IC current limiter complying with G.9		N/A
Q.1.2	Compliance and test method	(See appended table Annex Q.1)	P
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A)		—
	Current limiting method		—
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General requirements		N/A
R.2	Determination of the overcurrent protective device and circuit		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
R.3	Test method Supply voltage (V) and short-circuit current (A)).		N/A
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	Test specimen does not show any additional hole		N/A
S.3	Flammability test for the bottom of a fire enclosure		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Cheesecloth did not ignite		N/A
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (test condition), (°C)		—
	Test flame according to IEC 60695-11-20 with conditions as set out		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	After every test specimen was not consumed completely		N/A
	After fifth flame application, flame extinguished within 1 min		N/A
T	MECHANICAL STRENGTH TESTS		P
T.1	General requirements	See below	P
T.2	Steady force test, 10 N		N/A
T.3	Steady force test, 30 N	(See appended table T.3)	P
T.4	Steady force test, 100 N	(See appended table T.4)	P
T.5	Steady force test, 250 N		N/A
T.6	Enclosure impact test		N/A
	Fall test		N/A
	Swing test		N/A
T.7	Drop test	(See appended table T.7)	P
T.8	Stress relief test	(See appended table T.8)	P
T.9	Impact Test (glass)	No such devices within the EUT	N/A
T.9.1	General requirements		N/A
T.9.2	Impact test and compliance		N/A
	Impact energy (J)		—
	Height (m)		—
T.10	Glass fragmentation test	(See sub-clause 4.4.4.9)	N/A
T.11	Test for telescoping or rod antennas	No such devices within the EUT	N/A
	Torque value (Nm)		—
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General requirements		N/A
U.2	Compliance and test method for non-intrinsically protected CRTs		N/A
U.3	Protective Screen.....	(See Annex T)	N/A
V	DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)		N/A
V.1	Accessible parts of equipment		N/A
V.2	Accessible part criterion		N/A



IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
L2	interchangeable	interchangeable	4.7 μ H \pm 20%, 180 $^{\circ}$ C	Applicable parts of IEC 62368-1	Test in the appliance	
MOSFET (Q2)	CET-MOS Corp	CEM3119A	V _{DS} : 20V (N channel), -30V (P channel) , I _D : 9A (N channel), -8A (P channel)	Applicable parts of IEC 62368-1	Test in the appliance	
MOSFET (Q4,Q5)	Developer Microelectronics CO LTD	DP8205A	V _{DS} : 20V, I _D : 5A	Applicable parts of IEC 62368-1	Test in the appliance	
R12	interchangeable	interchangeable	0.022 Ω \pm 1%, 1/4W	Applicable parts of IEC 62368-1	Test in the appliance	
IC(U2, U3)	HYCON Technology Corporation	HY2113-CB1A	Overcharge detection voltage: 4.275 V \pm 0.05V, Overdischarge detection detection: 2.30 V \pm 0.1V	Applicable parts of IEC 62368-1	Test in the appliance	
MOSFET (Q8, Q9, Q10, Q11)	Developer Microelectronics CO LTD	DP8024	V _{DS} : 20V, I _D : 9.5A	Applicable parts of IEC 62368-1	Test in the appliance	
IC(U4)	HOLYTA	H266	VDD:- 0.3V~+6.5V	Applicable parts of IEC 62368-1	Test in the appliance	
NTC (Rt1)	DONGGUAN SENSICOM ELECTRONCS TECHNOLOGY co., ltd	SNS104	100K Ω at 25 $^{\circ}$ C	UL 1434	UL recognized	
Battery Cell	Jiangxi DBK Co., Ltd	1166110	Nominal voltage: 3.7V, 10000 mAh, 37 Wh. Li ion rechargeable cell	IEC 62133: 2012	CB/TUV	
Plastic Material List:						

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Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
PCB	GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD	ILM-R1	Min. V-0, 130°C	Applicable parts of IEC 60950-1, UL 94	UL recognized	
-Alt.	KINGBO ARD LAMINATES HOLDINGS LTD	KB-6160	Min. V-0, 130°C	Applicable parts of IEC 60950-1, UL 94	UL recognized	
-Alt.	JIANGSU SUNYUAN AEROSPACE MATERIAL CO.,LTD	V-66	94 V-0, 130°C	Applicable parts of IEC 60950-1, UL 94	UL recognized	
-Alt.	interchangeable	interchangeable	Min. V-1, 130°C	Applicable parts of IEC 62133, UL 94	UL recognized	
Plastic enclosure (top and bottom cover)	SABIC INNOVATIVE PLASTICS US L L C	C6200(GG)	V-0, 75 °C min. 1.5 mm thickness	Applicable parts of IEC 62133, UL 94	UL recognized	
Supplementary information:						
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.						
2) Description line content is optional. Main line description needs to clearly detail the component used for testing.						

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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests		N/A
(The following mechanical tests are conducted in the sequence noted.)			
4.8.4.2	TABLE: Stress Relief test		—
	Part	Material	Oven Temperature (°C)
4.8.4.3	TABLE: Battery replacement test		—
Battery part no.:			—
Battery Installation/withdrawal		Battery Installation/Removal Cycle	Comments
		1	
		2	
		3	
		4	
		5	
		6	
		8	
		9	
		10	
4.8.4.4	TABLE: Drop test		—
Impact Area	Drop Distance	Drop No.	Observations
		1	
		2	
		3	
4.8.4.5	TABLE: Impact		—
Impacts per surface	Surface tested	Impact energy (Nm)	Comments



IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.8.4.6	TABLE: Crush test			—
Test position		Surface tested	Crushing Force (N)	Duration force applied (s)
Supplementary information:				

4.8.5	TABLE: Lithium coin/button cell batteries mechanical test result			N/A
Test position		Surface tested	Force (N)	Duration force applied (s)
Supplementary information:				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE : Classification of electrical energy sources	N/A
------------	--	-----

5.2.2.2 – Steady State Voltage and Current conditions

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (Vrms or Vpk)	I (Apk or Arms)	Hz	

5.2.2.3 - Capacitance Limits

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters		ES Class
				Capacitance, nF	Upk (V)	
			Normal			
			Abnormal			
			Single fault – SC/OC			

5.2.2.4 - Single Pulses

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Duration (ms)	Upk (V)	Ipk (mA)	
			Normal				
			Abnormal				
			Single fault – SC/OC				

5.2.2.5 - Repetitive Pulses

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	Ipk (mA)	
			Normal				
			Abnormal				
			Single fault – SC/OC				

Test Conditions:

1. Abnormal & Single fault conditions for No. 1 & No. 2 were evaluated at approved power supply.
2. Abnormal & Single fault conditions for No. 3 were evaluated at Annex Q. See Table Annex Q.1 for details.

Supplementary information: SC=Short Circuit, OC=Short Circuit



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Clause	Requirement + Test		Result - Remark		Verdict
5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements				P
	Supply voltage (V) :	5.25 Vdc (Charging with full discharge battery)	Supplied by full charged battery pack (O/P:2.4A)	Supplied by full charged battery pack (USB1+USB 2 O/P:2.4A)	—
	Ambient T _{min} (°C) :	40	40	40	—
	Ambient T _{max} (°C) :	40	40	40	—
	Tma (°C) :	40	40	40	—
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)
Below values for T (°C) are re-calculated to 40 degree C from actual ambient respectively:					
PCB near MOSFET(Q2)		74.3	103.4	98.8	130
PCB between MOSFET (Q4 and Q5)		61.7	89.5	86.2	130
PCB near IC (U2)		63.3	95.8	90.6	130
PCB near IC (U3)		61.6	95.0	89.9	130
PCB near IC (U4)		52.4	59.7	57.0	130
PCB between MOSFET (Q8 and Q9)		64.6	103.9	98.1	130
PCB between MOSFET (Q10 and Q11)		62.6	97.5	92.1	130
PCB near L2		70.5	99.7	95.5	130
Cell body		44.1	50.8	50.7	100
Inside of plastic enclosure near cell		43.4	48.4	47.7	75
Inside of plastic enclosure near PCB (L2) inside		47.4	55.1	53.1	(For stress relief)
Below values for T (°C) are re-calculated to 25 degree C from actual ambient respectively:					
External plastic enclsure outside near cell		31.0	37.0	36.4	48
External plastic enclsure outside near MOSFET(Q2)		35.5	43.8	44.3	48
External plastic enclsure outside near (Q8 and Q9)		35.1	43.5	43.1	48
External plastic enclsure outside near MOSFET (Q10 and Q11)		34.7	42.5	42.7	48
External plastic enclsure outside near L2		39.5	49.9	49.0	48

Note: The temperature test result of accessible part can not comply with touch temperature limits TS1 (48 degree C) according to Table 38.

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P	
	Supply voltage (V) :	5.25 Vdc (Charging with full discharge battery)	Supplied by full charged battery pack (O/P:2.4A)	Supplied by full charged battery pack (USB1+USB 2 O/P:2.4A)	—		
	Ambient T _{min} (°C) :	40	40	40	—		
	Ambient T _{max} (°C) :	40	40	40	—		
	Tma (°C) :	40	40	40	—		
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)		
Supplementary information:							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
—	—	—	—	—	—	—	—
Supplementary information:							
Note 1: Tma should be considered as directed by applicable requirement							
Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)							

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics		N/A
Penetration (mm)..... :			—
Object/ Part No./Material	Manufacturer/t rademark	T softening (°C)	
supplementary information:			

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics			N/A	
Allowed impression diameter (mm) :			≤ 2 mm		—
Object/Part No./Material		Manufacturer/trademark	Test temperature (°C)	Impression diameter (mm)	
Supplementary information:					

5.4.2.2, 5.4.2.4 and 5.4.3	TABLE: Minimum Clearances/Creepage distance						N/A
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequenc y (kHz) ¹	Required cl (mm)	cl (mm) ²	Required ³ cr (mm)	cr (mm)
Supplementary information:							
Note 1: Only for frequency above 30 kHz							
Note 2: See table 5.4.2.4 if this is based on electric strength test							
Note 3: Provide Material Group							

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.2.3	TABLE: Minimum Clearances distances using required withstand voltage				N/A
	Overvoltage Category (OV):				
	Pollution Degree:				
Clearance distanced between:		Required withstand voltage	Required cl (mm)	Measured cl (mm)	
Supplementary information:					

5.4.2.4	TABLE: Clearances based on electric strength test			N/A
Test voltage applied between:		Required cl (mm)	Test voltage (kV) peak/ r.m.s. / d.c.	Breakdown Yes / No
Supplementary information:				

5.4.4.2, 5.4.4.5 c) 5.4.4.9	TABLE: Distance through insulation measurements					N/A
Distance through insulation di at/of:	Peak voltage (V)	Frequency (kHz)	Material	Required DTI (mm)	DTI (mm)	
Supplementary information:						

5.4.9	TABLE: Electric strength tests			N/A
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
Supplementary information:				
This test was conducted on EUT with all sources of building-in power supply listed in table 4.1.2.				



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Clause	Requirement + Test	Result - Remark	Verdict

5.5.2.2	TABLE: Stored discharge on capacitors					N/A
Supply Voltage (V), Hz	Test Location	Operating Condition (N, S)	Switch position On or off	Measured Voltage (after 2 seconds)	ES Classification	
Supplementary information: X-capacitors installed for testing are: <input type="checkbox"/> bleeding resistor rating: <input type="checkbox"/> ICX: Notes: A. Test Location: Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth B. Operating condition abbreviations: N – Normal operating condition (e.g., normal operation, or open fuse); S –Single fault condition						



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Clause	Requirement + Test	Result - Remark	Verdict

5.6.6.2	TABLE: Resistance of protective conductors and terminations				P
Accessible part	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)	
Supplementary information:					

5.7.2.2, 5.7.4	TABLE: Earthed accessible conductive part			N/A
Supply voltage			—	
Location		Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7	Touch current (mA)	
		1		
		2*		
		3		
		4		
		5		
		6		
		8		

Supplementary Information:

Notes:

[1] Supply voltage is the anticipated maximum Touch Voltage

[2] Earthed neutral conductor [Voltage differences less than 1% or more]

[3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3

[4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.

[5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.



IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

6.2.2	Table: Electrical power sources (PS) measurements for classification					P
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s ^{*)}	PS Classification	
A	Cells output Before PCB	Power (W) :	26.81	26.85	PS2	
		V _A (V) :	3.73	3.73		
		I _A (A) :	7.19	7.20		
B	USB output	Power (W) :	13.67	10.36	PS1	
		V _A (V) :	4.92	3.74		
		I _A (A) :	2.78	2.77		
C	USB output ¹⁾	Power (W) :	15.67	15.31	PS2	
		V _A (V) :	3.20	3.23		
		I _A (A) :	4.90	4.74		
D	USB output ²⁾	Power (W) :	10.15	9.92	PS1	
		V _A (V) :	3.59	3.61		
		I _A (A) :	2.83	2.75		
E	USB output ³⁾	Power (W) :	12.07	12.06	PS1	
		V _A (V) :	3.45	3.50		
		I _A (A) :	3.50	3.45		

Supplementary Information:

(*) Measurement taken only when limits at 3 seconds exceed PS1 limits

1. R12 short circuit
2. Q10, S1 Pin 2-Q11, S2 Pin 6 short circuit
3. Q4, Pin 2, D - Pin 3, S2 short circuit



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Clause	Requirement + Test	Result - Remark	Verdict

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)				N/A
Location		Open circuit voltage After 3 s (V _p)	Measured r.m.s current (I _{rms})	Calculated value (V _p × I _{rms})	Arcing PIS? Yes / No
Supplementary information: An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V _p) and normal operating condition rms current (I _{rms}) is greater than 15.					